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PSYCHIATRIC DISORDERS ASSOCIATED WITH CHILDBIRTH[1]

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The subject for this study is the nature of psychiatric illness occurring in association with childbirth and the attainment of motherhood, a definite psychological goal for women.

It is a commonly accepted fact that stressful life situations are often associated with illness, particularly with psychiatric illness. Observers have often been puzzled by finding that the attainment of a goal, i.e., success, may constitute just such a stress, and that illness may occur at this time (12). In studying such phenomena different points of view may be adopted: it is possible to see the illness as a reaction to the stresses of the precipitating event or as the end product of a gradual pathological life development. In the following study these approaches will be combined in order to gain a clearer understanding of the relationships between life development, personality, a specific pathogenic life situation, and psychiatric illness.

Review of Literature

Profound emotional disturbances associated with childbearing have attracted the attention of physicians since early recorded times (39). In recent studies, the incidence of these conditions varies from 3 per cent to 18 per cent of all females admitted to psychiatric hospitals (3, 5, 6). Most of them can be handled satisfactorily by the obstetrician or by a psychiatrist on an out-patient basis; few cases require psychiatric hospitalization (2, 5). There is actually little agreement, however, as to the number of women who do need intensive treatment (2, 5, 23). Hemphill (16) gives an incidence of .17 per cent in 37,000 deliveries over a 10-year period. Many American studies use the commonly accepted figure—1 in 400 deliveries.

The time of onset as related to pregnancy also varies considerably in the available studies. There is general agreement that the majority of illnesses begin during the early puerperium. Boyd, in a careful review (5), suggests an average of 14 per cent with an onset during pregnancy, 54 per cent during the first two weeks after parturition, and 32 per cent during the later puerperium. Linn (23) is in favor of restricting the term "post-partum psychosis" to those reactions whose onset is within two weeks after delivery; he finds these to have a highly favorable prognosis for complete recovery.

There is general agreement in most studies as to the age of onset of these illnesses: the peak occurs at 28. However, there is disagreement as to the parity of the mothers. Some authors found greater numbers of multiparas in their series (2, 29); others found that women expecting their first baby were more susceptible (17, 31).

The religious background of patients suffering from these disorders has evoked considerable interest; the findings of Strecker and Ebaugh (35) and Smalldon (34) that there is a higher incidence among Jewish women have been disputed disputed by Brew and Seidenberg (6).

Until the advent of asepsis and antibiotic therapy, many of the delirious reactions and excitements which were described undoubtedly had a toxic-exhaustive basis (3, 4). The only contemporary observers who give a high incidence (48 per cent) of delirious reactions point out that many of the patients come from a poor economic background and could not receive the benefits of modern prenatal care (29). A

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detailed physiological study of 14 psychotic mothers made in England in 1934 showed renal impairment in all but one case and reported improvement following treatment aimed at reversing a number of biochemical imbalances (28). Studies of body-build have recently appeared (29).

Among psychiatrists who have studied the psychodynamics of these illnesses there have been two general trends or attitudes: The first, which sprang from Macdonald's work in the 19th century (25), regarded them as specifically brought about by pregnancy and parturition (5, 15, 16, 20, 23, 35). This approach has led to several interesting theoretical formulations. Thus Zilboorg sees parturition as a symbolic castration, occurring in narcissistic, frigid, latently homosexual women. The "loss" of a child leads to overwhelming hostility directed against it (37, 38). Deutsch, in her review of psychoanalytic observations (7), recognizes two possibilities: the psychosis may reflect a primary oral urge to devour the child, or it represents a breakdown in the face of a conflict between the woman's strivings towards personal growth ("ego-enlargement") and her desire for reunion with the child ("maternal instinct"). The importance for the mother of the experience of separation from her child is also stressed by Linn and Polatin. They describe "reactivation" of earlier postpartum psychoses in former patients whose only child, now an adult, left home to go to college or to get married (24). Few studies have been recorded in the literature of the emotional reactions that "normal" women undergo in the setting of pregnancy, parturition, and the puerperium. The role of anxiety, its sources, and its effects on the mother and child have been studied by Greenacre and others (14, 19, 22). Escalona decribes an initial post-partum sensation of relief from the anticipatory anxieties of parturition. This is often followed by phases of bewilderment, marked passivity, and morbid concern over the child's physical and sexual makeup. The normal mother's inability to cope with her own dependency needs in the face of the demands made upon her by the newborn infant was felt to be responsible for these reactions (10). Eissler describes a brief post-partum phase of "passionate triumph" stemming from the realization that the woman has reached the maximum of her creative potential and feels that this may be a significant factor in depressions occurring at this time (9).

The second general trend in psychodynamic investigation is to see the psychiatric disturbance associated with reproduction as incidental to the course of a basic personality disturbance. Thus, pregnancy and delivery actually serve to worsen a pre-existing illness (4, 13, 17, 18, 27, 29, 31). A number of investigators have been struck by the decidedly masculine orientation of these patients (17, 24, 34, 38); they suffer from a general dissatisfaction at being women, tend to be independent, self-supporting, perfectionistic, sexually inhibited and maladjusted, frequently marrying late after prolonged courtships. These women often strive actively to become pregnant, but characteristically for non-maternal reasons, e.g., to overcome nervousness, to please their parents, or to preserve an unsatisfactory marriage. Occasionally they are mildly elated during pregnancy but generally are asymptomatic, having such an unusually smooth prenatal course that it is actually thought by some investigators (29, 32) that pregnancy "protects" the patient against the illness. Previous depressions, severe enough to require hospitalization, were found in 36 per cent of the patients intensively studied by Linn and Polatin (24). Few studies are in agreement about the quantitative and qualitative nature of the pre-existing psychopathology. The very high incidence of hereditary predisposition (25 per cent in the series by Hemphill (16) and 50 per cent in that by Parfitt (28)), as well as the frequent background of broken homes and early environmental deprivation, serves to support the idea that the illnesses associated with childbirth are not essentially different from other psychiatric disorders. Saunders (31) finds sexual maladaptation the main psychogenic factor responsible for these illnesses which, in her experience, differ in no way from psychoses of corresponding types at other life epochs. Anderson, however, in a meticulous point-by-point comparison of 50 patients with post-partum reactions and 50 comparable illnesses without childbirth, finds no specific difference in the sexual histories or sexual psychopathology of two groups (1).

Some authors clearly feel that the sex of the

child is of significance, and that mothers having male offspring predominate among these patients (34). Others deny that this is a significant factor (6, 24). Many contemporary investigators agree that hostility towards the child is an almost constant finding in these patients (6, 17, 34, 36, 37). Suicide and infanticide are serious complications found in almost all major studies of this problem, and have been subjected to further investigation by some authors as distinct psychopathological reactions (26, 33).

In reviewing the literature, the wide degree of variation in the differential diagnostic breakdowns of these illnesses is quite striking:

	Schizophrenia	Manic Depressive	Delirium
	%	%	%
1911—Runge (30)	37	20	25
1926—Strecker and Ebaugh (35)	26	36	34
1927—Kilpatrick and Tiebout (21)	14	50	30
1928—Saunders (31)	60	40	
1933—Anderson (1)	18	70	6
1940—Smalldon (34)	30	50	
1942—Boyd (5)	20	40	29
1950—Brew and Seidenberg (6)	52	42	
1955—Polonio and Figueiredo (29)	28	3	48

Only Ewald stresses the enormous difficulty that is so often encountered in trying to arrive at an accurate diagnosis in the majority of these cases (11). The question has not been raised whether this is in itself a characteristic of these disorders, or if the confusion stems from a lack of understanding of pertinent psychodynamic and psychopathological factors.

The techniques and results of treatment as described in literature are found to be at considerable variance. James, whose over-all recovery rate is 70 per cent, concludes that prognosis depends on diagnosis (he noted depression in all cases irrespective of diagnostic classification), number and severity of previous attacks, family history of psychiatric disorders, and the status of the patient's marriage (18). While some authors are impressed by the poor therapeutic responses and the guarded prognosis in these conditions (2, 6), a more optimistic outlook is taken by those who recommend intensive treatment, including electric convulsive treatment (3). Douglas feels that the mother's recovery is facilitated when the newborn child remains in the hospital with the mother who thus can work through, psychotherapeutically; the practical and emotional problems of infant care (8). Victoroff, who views "para-partum" psychoses not as disease but as events in the lives of his patients, shows that the recovery rate is better when psychotherapy is carried out both between and during pregnancies. Nevertheless, his relapse rate was 60 per cent (36). Rates of recovery and recurrence vary enormously in the majority of studies which have been reviewed, all of which suffer from a lack of complete follow-up of the patients.

Clinical Study

Selection and classification of patients

Fifty-four patients were selected from all females (3,000) admitted to the Payne Whitney Psychiatric Clinic of The New York Hospital, from 1933 to 1955. Criteria used were that the onset of their first illness occurred during a period of 90 days before or after delivery of a baby and hospitalization was of sufficient duration to permit a complete study. Cases which did not fulfill these criteria for selection were nonetheless reviewed for information which might augment or corroborate our findings.

On the basis of fundamental psychopathological constellations, the patients can be grouped into three distinct types: I) disorganized, II) depressed, III) paranoid.

Group I (disorganized). Twenty-seven patients constituted this group in which the clinical picture was characterized by disorganization. They were excited, confused, fearful, and assaultive. Hallucinations, misinterpretations and delusions were usually present. Posturing, destructiveness, symbolic and autistic language and activity made their hospital course stormy. Sexual excitement with open masturbation and homoerotic behavior occurred frequently. The concomitant findings of elation and/or depression often led to an initial impression of a manic depressive reaction, but with closer observation the affect was

found to be markedly inappropriate, and invariably the presence of schizophrenia became obvious. These mothers were usually completely incapable of caring for their children and often denied, in their thinking and behavior, the fact that childbirth had occurred.

Case 1: A 29-year-old Jewish woman entered the hospital 12 days after the birth of her first child, a boy. Labor, lasting 8 hours, and delivery had been uncomplicated. Immediately after the delivery, she became overtalkative and elated, but irritable and critical of the hospital personnel. She went home on the 9th postpartum day, developed increasing tension, restlessness, insomnia, and frequently desired to be affectionately caressed by her husband. She was unable to organize her day, and nursing the child became increasingly difficult. Three days later she began to posture and spent hours applying her makeup. She talked excitedly on the telephone, developing the belief that the pediatrician was trying to trick her and that she had been hypnotized during the delivery. With increasing excitement she talked of writing a book called "Rebirth". She talked about herself as the Virgin Mary and her husband as Joseph. On admission, physical examination was essentially negative, and laboratory studies were within normal limits. Her psychiatric examination showed overactivity, pressure of speech, moderate elation, hallucinations of God's voice, ideas of reference, misidentification, and the delusional preoccupations mentioned above. Memory loss and confused thinking, and impaired judgment were present. In the hospital she showed excitement, inappropriate laughing and crying, destroyed furniture, and assaulted nurses. She spat, smeared sputum, refused to eat, and tried to drown herself in the bathtub. She denied having had a baby—"I've had a monstrosity." There was posturing, erotic talk, and delusions of Lesbians and "half-men" in her room. Mixed eroticism and resentment was shown toward males. She received six electric convulsive treatments during her five month hospital course. One year later she was reported doing well.

The oldest of three children, she had a dependent, passive father and a stable, cheerful mother who died six years after her birth. Raised by different relatives, she was a lonely child, much given to intellectual pursuits and docile-submissive attachments to others. She stated that at 6 a neighbor tried to "rape" her. She won scholarships and graduated with a brilliant record from a teachers' college. Thereafter she began a successful career in designing and advertising in New York City. She was a shy, dependent, sensitive, highly ethical person with strong feelings of physical inadequacy and loneliness. At 22 she married a struggling news correspondent after a two-year courtship during which she was the aggressor. Living on her salary, her husband became increasingly dissatisfied with the marriage and separated from her to work in the Orient. After a number of years of bitter conflict, she persuaded him to return to the United States one week before the attack on Pearl Harbor, and became pregnant.

Group II (*depressed*). In 14 patients, the outstanding feature was depression accompanied by feelings of unworthiness, guilt, and inadequacy, and frequently culminating in one or several suicidal attempts. Mild paranoid projections and varying degrees of disorganization in routine led to inability to care for their children. Lethargy, apathy, inactivity, obsessive ruminative thinking, and phobic anxiety frequently accompanied the depression. These patients were able to care for their children only with a great deal of support; they were keenly aware of a feeling of failure as mothers.

Case 2: A 27-year-old Protestant housewife was admitted to the hospital one month after the delivery of her first child, a girl. During the 8th month of pregnancy she had begun to experience doubts about minor dissatisfactions concerning her apartment, felt "trapped", and had difficulty organizing her daily routine. Following an uncomplicated delivery she became depressed, anxious, tense, and obsessively concerned with her inability to handle the child. (She had wished for a boy.) Insomnia, anorexia, and a fear of harming her child, and feelings of hopelessness mounted, and she attempted suicide by ingesting aspirin. She expressed a need to suffer and to punish herself for a lack of maternal feelings. On admission, physical examination was negative. Laboratory findings, including an electroencephalogram, were within normal limits. Psychiatric examination found her depressed, retarded, and obsessed with a conviction that she had ruined the lives of her husband, daughter, and self. Concentration, insight, and judgment were impaired. Memory and orientation were normal.

During a two-month course of psychotherapy while receiving reserpine, she improved but then again became depressed. Increasing withdrawal, culminating in resistiveness, mutism, negativism, and attempts at blinding herself, necessitated a series of 18 electric convulsive treatments. Visits home and contact with her child led to recurrence of depression with delusions and guilt. Psychotherapy carried on throughout her hospitalization revealed conflicts in her attitudes towards her father and husband, hostility toward her mother and daughter, and homosexual feelings since adolescence. A constant need for perfectionism and submissive suppression of anger was discussed. The patient's inability to handle dynamic material led to an increasingly supportive and directive approach by her therapist. Nevertheless, after 9 months of treatment she had not improved sufficiently to return home and was transferred to a state hospital where she remains at the present time.

The patient was born of a crippled, alcoholic, explosive, and miserly father who died when she was 14, and a mother who suffered from recurrent depressive illnesses throughout life. She was the fourth of five children. The patient made an average scholastic adjustment and worked from the age of 14 until her pregnancy. She held a number of demanding secretarial

positions, with increasing success. She made a good social adjustment, was attractive, quiet, thrifty, and displayed "good common sense". After marriage at 23 she supported her husband, an easygoing, devoted, passive man who later became a successful engineer. Menarche occurred at 14 years, mild depression accompanied menstruation, and an active sexual life with frequent orgasm began after marriage.

Group III (paranoid). The outstanding characteristics of this group of 13 patients were inaccessibility, defensiveness, guardedness, sensitivity, and suspiciousness, best described as paranoid. Although these patients can discuss their problems in an intelligent fashion, reality is distorted through projection and denial. Ideas of reference are common. These patients resist hospitalization and treatment, often refusing to cooperate with a series of doctors and finally manipulating a close relative into taking care of them. Because they rarely show outstanding depression and remain superficially well organized, suicidal and infanticidal attempts are exceedingly dangerous and often successful. Resentment is prominent and they are critical, controlling mothers. Although they often beg and demand to be with their children, they can show little true affection for them. Their child-care is hampered by a rigid, perfectionistic, and tense approach.

Case 3: A 31-year-old Presbyterian housewife was delivered of twin boys after an uneventful pregnancy, her first. Four weeks later she began to feel "exhausted" and asked her mother to help care for the children. She developed ideas of reference about the neighbors, feeling accused of inadequacies as a mother. She became tense, seclusive, and increasingly perfectionistic in managing the children. She developed paranoid delusions consisting of the belief that relatives were trying to break up her marriage and that well-known novels made derogatory references to her. Three months postpartum, she attempted to kill herself by drinking Lysol and cutting her wrists. One month later she agreed to enter the hospital. Physical examination was negative, and laboratory findings were within normal limits. Psychiatric examination revealed an attractive woman, mildly depressed and retarded, who had well-demarcated ideas of reference close to paranoid projection; and bizarre, self-depreciatory ideas were prominent in her psychotherapeutic relationship. She was able to review her life history in some detail, recalling chronic death fears and guilt. Since adolescence she had been aware of homosexual desires and a desire to be a man. In two months of hospitalization there was marked symptomatic improvement leading to her insistence on leaving the hospital to care for her sons. She was able to make a satisfactory adjustment until two years later when she became pregnant again, delivered uneventfully, wrote a letter to her former therapist stating, "This time I feel sure things will be different," and two months later poisoned herself and her three children.

Her father was a teacher, suspicious, withdrawn, and aloof; her mother, an ambitious, disappointed, controlling woman who pushed the patient into a successful career. A younger sister had ulcerative colitis. The patient was a highly intelligent and aggressive woman who achieved Phi Beta Kappa with little difficulty. She was a successful business woman and fashion designer who worked until the fifth month of her pregnancy. Following a homosexual affair at 25, she began sexual relations with her future husband, a passive unsuccessful man. At 29 she married, but remained frigid and felt unhappy and inadequate as a wife. A sensitive woman with very high standards, she covered up her underlying insecurity with an outward confidence and independence, and wanted children in order to prove herself capable of being feminine.

Analysis of Case Material

Identifying characteristics of patients

All of the patients were married, Caucasian women. They came from all socio-economic strata, with the majority from a middle socio-economic level. At the time of admission, most patients were between the ages of 24 and 34; there was a cluster of Group I patients in the 25-29 year age range, while Group II and III patients tended toward a greater scattering in age, with a preponderance of older women (table 1). Forty-two and three-tenths per cent of the patients were Protestant, 36.6 per cent Jewish, and 21.1 per cent Catholic. These percentages differ from those found in a group of 200 unselected females admitted to the hospital in this age period, which were: Protestant 51.5 per cent; Catholic 27.5 per cent; and Jewish 21.0 per cent. The patients had not had previous psychiatric illnesses, and had the acute

TABLE 1.—Psychiatric Disorders Associated with Childbirth
(54 patients)
Age distribution

Age	Group I	Group II	Group III	All Patients
20–24	4	1	1	6
25–29	16	4	5	25
30–34	5	5	4	14
35–39	2	3	3	8
40–44	0	1	0	1
Total...	27	14	13	54

onset of their illness within 90 days before or after the delivery of a child. Thirty-four illnesses began in the first month, five in the second month, and five in the third month post-partum; only six began in the three months pre-partum. Most of the patients (32) became ill in relation to the delivery of their first child; 13 in relation to the second child; six to the third child; and one each to the fourth and sixth child. The sex of the infant was not statistically significant, a random distribution occurring in all groups. The average length of hospitalization was four months.

Characteristics of illness

1. *Diagnosis.* Clinical diagnoses were arrived at jointly by the authors after an intensive review of the entire clinical record in each case. Included were: schizophrenic reactions (39), manic depressive depressions (2), psychotic depressive reactions (5), paranoid states (4), psychoneuroses (3), and psychopathic personalities (1). As can be seen from table 2, a marked variation in diagnosis occurred among the three groups of patients. All patients in Group I had schizophrenic reactions with paranoid and catatonic features. Six of the seven depressive reactions occurred in Group II, while all the paranoid states occurred in Group III.

2. *Psychopathology.* Fundamental psychopathologic findings in all groups corresponded to basic diagnostic criteria. Certain secondary features, which are commonly not regarded as crucial, served either as common denominators for all the patients or as significant distinguishing features of one or more of the subgroups. These psychopathologic findings and their occurrence may be found in table 3. Paranoid delusions and hallucinations were present in 34 patients. Paranoid defensiveness was considered present when the patient manifested incontrovertible suspiciousness, refusal to divulge factual material to the therapist, deliberate guardedness in her interpersonal relationships, and ideas of reference. Depression was manifested by retardation, self-depreciatory ideas, ideas of futility, the subjective experience of deep sadness, or suicidal thoughts or actions. Destructive behavior was considered present if actual destructive or assaultive activity took place during hospitalization.

TABLE 2.—PSYCHIATRIC DISORDERS ASSOCIATED WITH CHILDBIRTH
(54 patients)
Diagnostic categories

Category	Group I	Group II	Group III	All Patients
Schizophrenic reactions	27	7	5	39
Manic depressive, depressed	0	2	0	2
Depressive reactions	0	4	1	5
Paranoid reactions	0	0	4	4
Psychoneurotic reactions	0	1	2	3
Psychopathic personality	0	0	1	1
Total	27	14	13	54

TABLE 3.—PSYCHIATRIC DISORDERS ASSOCIATED WITH CHILDBIRTH
(54 patients)
Psychopathologic characteristics

Characteristics	Group I	Group II	Group III	All Patients
Paranoid delusions and hallucinations	25	4	5	34
Paranoid defensiveness	8	6	11	25
Depressed	20	14	12	46
Destructive	21	1	1	23
Fear	18	8	7	33
Sexual disturbance	24	7	5	36

Fear was distinguished from anxiety and apprehensiveness; it was considered to be present only if the patient experienced and manifested a definite fear of specific trauma from specific activity in herself or in the environment. Sexual disturbance was manifested by heterosexual or homosexual erotic activity in relation to other patients or the staff, or by open and excessive masturbation.

It will be seen that paranoid delusions and hallucinations were a very common feature in Group I, but were quite unusual in Groups II and III.[2] Conversely, paranoid defensiveness was uncommon in Group I, more common in Group II, and present in 11 of 13 patients in Group III. Depression occurred commonly in all three groups (by definition, it was found in all of Group II), and fear occurred in a large number of each group. Destructive behavior

[2] The content frequently included injury or destruction of the infant, impending punishment for failure, and sexual themes.

and sexual disturbance, such as open masturbation and erotic advances to other patients, were common in Group I and much less so in Groups II and III. Confusion was present in several illnesses, but its presence could not be determined with sufficient reliability to warrant tabulation.

Family constellation

1. ***Paternal and maternal figures.*** In an attempt to clarify the patients' concept of their paternal and maternal figures, the characterization of these figures as given by the patients was tabulated for each parental figure in the following categories: ***Strong*** (successful, stern, highly emotional, dominating rigid, violent temper); ***Weak*** (inadequate, vain, volatile, permissive, alcoholic); ***Unreliable*** (dead, criminal, alcoholic, distant, dour, emotional, passive); ***Dominating*** (controlling, aggressive, demanding, dominant, stable individual in a weak family); ***Rigid*** (obsessive concern, very efficient, self-centered, strict); ***Uses symptoms*** (nervous, invalid, hypochondriacal). These features overlap to some extent but, when applied to each parent, provide a substantial notion of the role which the parent assumed, in the patient's awareness, during the patient's early life. Unfortunately, the evaluation of the parent by objective observers (therapists, impartial relatives, close friends, referring physicians) is available in only half of the patients. Although these observations bear out the patients' evaluations, it appears wiser to limit the significance of the evaluation to that of a subjective impression on the part of the patient.

Within these limitations, several characteristics seem clear (table 4). In all groups, to a total of 43, the fathers were noted to be unreliable. Twenty-three fathers were characterized as weak, and 22 as strong. All of these features seemed to occur with equal frequency in each group of patients. Thirteen of the fathers were foreign-born, and six of these occurred in Group III. Only five fathers were alcoholic, and all of these were found in Group I.

In contrast to the fathers, only 17 mothers were characterized as unreliable, with eight of these being found in Group II. Instead, 33 mothers are noted to be dominating; the frequency of such a characterization is most marked in Group I, while it is present in less than half of Groups II and III. Although the mothers, as a group, operate in a dominating fashion, fewer of them are strong; this characterization is also most marked in Group I with 7 such mothers, while a higher percentage is regarded thus in Groups II and III. A total of 12 mothers used symptoms in dealing with their families; this manifestation, however, did not occur in Group III. With the mothers, as with the fathers, 14 parents had died before the onset of the present illness. The

TABLE 4.—PSYCHIATRIC DISORDERS ASSOCIATED WITH CHILDBIRTH
(54 patients)
Parental characteristics

Characteristics	Father				Mother			
	Group I	Group II	Group III	All Patients	Group I	Group II	Group III	All Patients
Death								
a) Before patient's 12th year	3	0	1	4	2	1	2	5
b) Before patient's 21st year	0	2	1	3	2	1	1	4
c) Before present illness	4	4	1	9	1	0	4	5
Criminal	2	0	0	2	0	0	0	0
Foreign-born	4	3	6	13	4	1	2	7
Strong	9	7	6	22	7	7	6	20
Weak	14	5	4	23	5	0	0	5
Unreliable	23	10	10	43	6	8	3	17
Dominating	2	1	1	4	20	7	6	33
Rigid	2	1	0	3	7	3	4	14
Used symptoms	1	1	0	2	7	5	0	12
Psychiatric illness	0	0	1	1	1	5	2	8
Alcoholic	5	0	0	5	1	0	0	1
No information	1	0	2	3	1	0	1	2

distribution of deaths was scattered evenly with the fathers, but 7 of the 14 deaths among the mothers had occurred in Group III.

2. *Siblings.* Within the same limitations, as described for evaluation of parents, the relations with siblings have been characterized as follows: *Pseudomaternal relationship* (patient called upon to nurse, care for, or guide a sibling); *Rivalry* (marked manifestations of sibling rivalry, persisting into adulthood); *Close relationship* (marked mutual dependency, extending into adulthood and interfering with extrafamilial relationships); *No siblings.*

A pseudomaternal relationship occurred only twice, in each instance in Group I. Marked rivalry was infrequent (7 instances) and distributed equally among the groups. A close relationship was present for 6 of the patients in Group I, 4 of the patients in Group III, but none of the patients in Group II. All of the patients in Groups II and III had siblings, while 6 of the patients in Group I were only children. The position among siblings appeared to be of no particular significance.

3. *Husband.* The personality characteristics of the husbands, as described by the patients and by the therapists, seemed to fall into no predominant category as correlated with types of personality, diagnostic criteria, or other variables. In 16 instances their personalities appeared to be similar to those of the patient's father, and in 6 instances to be similar to those of the patient's mother.

Personality

1. In the course of psychotherapy, it was possible to recognize certain personality strivings and conflicts. In evaluating these, as they appeared prior to pregnancy and illness, some predominant kinds of defenses could be discerned. These have been clarified and tabulated as follows: *Compulsivity* (meticulous, neat, rigid, perfectionistic, obsessive thinking, numerous compulsive rituals); *Suppression* (clear-cut conscious inhibition of recognized drives and desires, such as anger, sexual desire); *Denial* (inhibition of consciously recognized drives and desires, with conscious activity directed toward the opposite goal).

As can be seen in table 5, compulsivity was found to a marked degree, at an equal proportion in each group. Suppression, while common to all groups, was present in all the patients in Group II, and in 10 of the 13 patients in Group III. Denial, the active extrapolation of suppression, was infrequent in Group I, but present in 10 Group II patients and 10 Group III patients.

TABLE 5.—PSYCHIATRIC DISORDERS ASSOCIATED WITH CHILDBIRTH
(54 patients)
Personality mechanisms

Mechanism	Group I	Group II	Group III	All Patients
Compulsivity	19	10	11	40
Suppression	18	14	10	42
Denial	5	10	10	25

2. Masculine, feminine, and maternal characteristics. In order to determine the degree to which these patients showed masculine, feminine, and maternal characteristics in their pre-illness personality, each record was subjected to thorough analysis. A series of 18 items was selected from an original list of 75 items on the basis of their availability in our data and pertinence to the subject. The first six are considered to be "feminine", the next seven "masculine", and the last five "maternal".

1. Identification with mother
2. Narcissistic attitude toward body
3. Passive-submissive attitude toward others
4. Love of husband
5. Desire for coitus
6. Capacity for orgasm
7 Identification with father
8 Strong envy for, or identification with, a brother
9. "Masculine" wishes (desire to be a boy, or attempt to appear like one)
10. Severe menstrual disorders
11. Conscious homosexual desires
12. Career outside marriage
13. Aggressive-sadistic attitude toward others
14. Interest in dolls or babies during childhood
16. Desire for pregnancy
16. Desire to breastfeed child
17. Maternal warmth displayed toward child

18. Realistic attitude toward the practical aspects of raising a child

A summary of the scores made by all the patients may be found in table 6, which reveals an interesting preponderance of masculine characteristics in every group, most marked in Group I. Of particular interest in the formulation of these scores is the presence of a career in 37 patients, the presence of conscious homosexual desires in 20 patients, and the presence of aggressive-sadistic tendencies; the last were common in Groups I and III (18 and 11 patients, respectively) but occurred in only three patients in Group II.

In summary, the personalities of these patients prior to the onset of illness were marked by rigidity, suppression of emotional and instinctual drives, activities tending toward the denial of these drives, inadequate adjustment as women, and strong, frequently conscious, homosexuality. The use of the stronger mechanisms of suppression and denial was least marked in those patients (Group I) who developed the most disorganizing illnesses. Despite all the underlying sexual disturbance, the patients functioned in a role in life which could meet the criteria of that of a woman. Although they were rigid and pursued aggressive careers to an unusual degree, only one engaged in actual homosexual activity, and all entered into a female role which included marriage and childbirth.

TABLE 6.—PSYCHIATRIC DISORDERS ASSOCIATED WITH CHILDBIRTH
(54 patients)

Masculine, feminine, and maternal characteristics

Characteristics	Group I	Group II	Group III	All Patients
Identification with mother	3	6	1	10
Narcissistic attitude towards body	8	3	5	16
Passive- submissive attitude towards others	4	0	3	7
Love of husband	2	2	4	8
Desire for coitus	1	1	2	4
Capacity for orgasm	5	1	5	11
Identification with father	6	3	4	13
Identification with a brother	6	2	2	10
Masculine wishes	9	7	8	24
Severe menstrual disorders	3	0	4	7
Conscious homosexual desires	11	3	6	20
Career outside of marriage	16	11	10	37
Aggressive-sadistic attitude toward others	18	3	11	32
Childhood interest in dolls or babies	0	0	0	0
Desire for pregnancy	6	7	8	21
Desire to breastfeed child	1	1	1	3
Maternal warmth displayed towards child	3	0	2	5
Realistic attitude toward raising child	0	0	0	0

Significance of childbirth

1. *Desire for a child.* It will be noted in table 6 that only 21 patients expressed a desire for a child. The more thorough-going analysis to which these desires were subjected in the course of therapy, however, reveals the absence of a mature desire for offspring. For example, two patients wanted a child in order to prove that they were not masculine. Four patients wanted only to please their husbands. Three patients wanted to save a failing marriage. Two patients wanted to cure physical symptoms. Four patients wanted to please their parents or their relatives.

2. *Nature of relationship with child.* In the analysis of the patients' feelings toward their children, no information could be obtained in 7 patients. Although the patients felt proud of their children's appearance or behavior, they were aware of a sense of remoteness; feelings of love or warmth were not found. Feelings of hostility were recognized by patients in 19 instances.

In many patients the severity of illness prevented an analysis of their feelings toward the child, but significant clues could be obtained from dreams, fantasies, hallucinations, and delusions. Analysis of content revealed hostility in 31 patients.

Therapeutic results

1. Results of treatment at discharge were evaluated by the authors and placed into one of seven categories as follows: Death by suicide (S); More severely ill (W); no change (0); marked symptoms, but better adjustment in a hospital setting (1); Moderate symptoms, with some interference in life outside a hospital (2); Mild symptoms, with no interference in life outside a hospital (3); Symptom-free (4), (table 7).

TABLE 7. PSYCHIATRIC DISORDERS ASSOCIATED WITH CHILDBIRTH
(54 patients)
Results of treatment

Results	Psychopathologic Groups			All Patients		Diagnostic Categories					
	Group I	Group II	Group III	No.	Per cent	Schizophrenic	Depressed	Manic dep.	Paranoid re.	Psych. neur.	Psychopathic
Free from symptoms	1	0	0	1	1.9	1	0	0	0	0	0
Mild symptoms, no interference	4	1	4	9	16.7	5	1	0	0	2	1
Moderate symptoms, interference	3	9	4	16	29.6	8	4	2	1	1	0
Marked symptoms, better in hospital	2	1	2	5	9.3	4	0	0	1	0	0
No change	14	3	1	18	33.3	18	0	0	0	0	0
Worse	2	0	0	2	3.7	2	0	0	0	0	0
Suicide	1	0	2	3	5.5	1	0	0	2	0	0
Total	27	14	13	54	100.0	39	5	2	4	3	1

The larger percentage of patients who improved was in Group II and III, with 10 and 9 improved patients, respectively. Group I, on the other hand, with a much lower percentage of improvement (10 out of 27 patients), appeared to demonstrate a greater degree of improvement when improvement occurred. Thus 50 per cent of the improved patients in Group I had no interference from symptoms, while only 10 per cent of the improved patients in Group II achieved this level, and 44 per cent of the patients in Group III achieved this level. While only 4 patients in Group III did not improve, it is possibly significant that two of these died by suicide. Group II, when improvement was not marked to the degree which is achieved in Group I or Group III, had the best over-all percentage of improvement and was the only group in which no patient became worse and no patient committed suicide.

2. When the results of treatment are viewed according to diagnostic categories, it may be seen that the outcome of patients with schizophrenic reactions varies considerably according to the clinical group in which they fall. Thus, the 27 schizophrenic patients in Group I have an improvement rate of 37 per cent, and 12 schizophrenic patients in Group II and III have an improvement rate of 66.6 per cent.

All patients with depression, psychoneurosis, and psychopathic personality achieved a considerable degree of improvement. The four patients with paranoid states did poorly; only one achieved marked improvement, while one achieved a minimal improvement, and two died by suicide.

Thus, all instances of lack of improvement or minimal improvement are found among patients with schizophrenic reactions or paranoid states. All patients who do not present symptoms of disorganization, however, have a better prognosis; this is true even with the schizophrenic patients whose illnesses were characterized by features of depression or guardedness.

Prognostic variables

Since only a limited number of the patients in this study have been treated by the authors, it was felt that therapeutic elements should be confined to the discussion section. Some historical, personality, and psychopathologic elements appeared to differentiate patients with good and poor results in the three groups.

In Group I, 17 patients became worse, committed suicide, or did not improve in the course of their hospitalization. These 17 patients seemed to have certain characteristics which were not present in the 10 patients who did improve. Nine of these 17 patients had a "strong" father, a finding which is present in only 10 of the total group. Six patients had "strong" mothers, while only 7 patients in the entire group had such mothers. An additional finding, of less validity, is the fact that of the 3 patients who became worse or committed suicide, 2 expressed strong feelings of love for

their husbands; they were the only two in the group of 27 patients with this finding.

No such characteristic findings can be elicited with reference to the patients in Group I who improved. Of possible significance is the fact that 3 of the 5 patients who improved markedly had alcoholic fathers, a finding which was present in only 5 patients in the group. In addition, 4 of these 5 had "weak" fathers, while this finding was present in only 14 of the 27 patients in the group.

In Group II, the only significant feature which appeared to be associated with the nature of results was the fact that, of the 8 patients who were moderately improved, 5 manifested sexual disturbance, as previously defined, in the course of their hospitalization; only 7 of the 14 patients in this group had such manifestations.

In Group III, where the sharpest variation in results occurred, no variables appeared to be more than suggestive other than those previously associated with the diagnosis of *paranoid state.*

Discussion

In evaluating our findings, it is essential that there be a recognition of the limits within which this study operates. The authors have attempted to make an intensive study of those psychiatric illnesses related to childbirth, which have achieved a level of severity sufficient to warrant psychiatric hospitalization. No attempt has been made to study the more common emotional reactions related to childbirth. Sociologic investigation, follow-up studies, intensive investigation of the physiologic status, and effectiveness of somatic therapies have not been reported. Regardless of the many changes that the last 25 years have produced in these areas, the psychologic picture appears to have remained constant. The emphasis in this study therefore has been directed toward the clarification of the active dynamic psychopathologic picture, and those elements of treatment related to that picture.

From this viewpoint, it may be seen that a large number of the patients studied appear to have strikingly similar family backgrounds and personalities. Many were raised in a family setting dominated by the mother, with the father assuming a submissive role. Possibly as a result of identification difficulties secondary to the family constellation, most of the patients adopted a role in life which might best be seen as a compromise. They strove to fulfill a woman's role in life but found within that role many non-feminine means of satisfaction in aggressiveness, careers, and rigidity. Childbirth was anticipated as a goal by these women. This goal, however, seemed to be in the nature of a proof of femininity, and the previous rigidity and emotional remoteness which they had displayed would appear to indicate that difficulties in fulfilling the maternal role might be anticipated.

In this setting, the patients delivered and were subjected to the parturition stresses which have been indicated by Zilboorg (37, 38), Escalona (10), and Deutsch (7). It may be assumed that for the highly organized, very efficient type of personality which these women possessed, such experiences would be especially unsettling.

The personalities of the patients and the special significance of childbirth may be seen then in the illnesses associated with childbirth. Despite the fact that the illnesses fall into many diagnostic categories, they fit into one of three clinical categories: disorganized, depressed, and paranoid. These categories seem to be associated with different types of personality defenses; rigidity is common to all three groups, supression to the last two, and denial to the third. The clinical categories are also associated with different therapeutic results, as has been demonstrated. It is striking that this is true even among the patients with the diagnosis of schizophrenic reaction, who had a much more favorable improvement rate in Groups II and III than in Group I.

It may also be helpful to review the psychopathologic features which are common in all clinical categories. These include depression, paranoid manifestations, sexual disturbance, and hostility. The frequent appearance of these elements and the frequent manifestations of hostility toward the infant appear to corroborate Zilboorg's suggestion of homosexual tendencies and hostility toward the child as important specific elements in these illnesses.

A suggestion as to means of initiating successful psychotherapy in the hospital can be made on the basis of studying the features

which marked the psychotherapy of the 10 patients who achieved complete or nearly complete recovery. Four of these patients reorganized, denied the illness, and departed from the hospital against the therapist's recommendations. Their recovery appeared to be spontaneous, and little had been achieved toward providing them with more protection or happiness in their future lives.

The other six improved patients seemed to believe that the therapist had "sided" with them against their husbands, or mothers, or environment. In actuality, the therapists had evaluated the total dynamic situation and then centered therapeutic efforts on those aspects of the patient's personality which the patient regarded as "good", i.e., cleanliness, honesty, neatness, industriousness. Using these as a theme, he had analyzed their interaction with child, husband, and other figures in such a way that the patient could learn to modify her personality and learn new mechanisms for dealing with sexuality, love, sharing, and other needs. In conjunction with these discussions, frequent visits with the child and other figures were begun as soon as possible. The urgent need for the establishment of a healthy relationship with the child was recognized by the therapists, and they encouraged early visits out of the hospital to undertake care of the infant. Without discussing hostility directly, the therapist helped the patient to reduce it and redirect it, and thereby aided her to resume an active role in life. Since he was able to enlist the patient in this approach, it was possible for these women to continue psychotherapy after discharge, and to have the opportunity of exploring more basic feelings when they became able to do so.

Summary

1. Psychiatric disorders found in 54 patients hospitalized within three months of childbirth involve the diagnoses of schizophrenic reactions (39 patients), manic depressive depressions (2 patients), Depressive reactions (5 patients), paranoid reactions (4 patients), psychoneurotic reactions (3 patients), and psychopathic personality (1 patient). The clinical picture presented by these patients fell into three groups: Group I—disorganized (27 patients), Group II—depressed (14 patients), and Group III—paranoid (13 patients).

2. Evaluation of the life histories and personalities of these patients indicates that many come from a home in which the mother was the dominant parent, that they adopted aggressive, non-feminine roles in life, and that they used rigidity, suppression and denial as personality defenses.

3. Analysis of psychopathologic changes suggests that previous formulations relative to sexual disturbance and hostility toward the child may be correct. These specific factors related to childbirth may interact with previous personality development to produce the three clinical groups of illnesses.

4. Prognosis for these patients is poor, with only 10 patients achieving good recovery. Clinical grouping may influence prognosis. Paranoid manifestations seem to indicate an especial risk of suicide or homicide.

BIBLIOGRAPHY

1. Anderson, E. W.: A study of the sexual life in psychoses associated with childbirth. *J. Ment. Sc., 79:* 137–149, 1933.
2. Bamford, C. B.: An analytical review of a series of cases of insanity with pregnancy. *J. Ment. Sc., 80:* 58–63, 1934.
3. Bellak, L.: *Manic-depressive Psychosis and Allied Conditions*, Chap. 12. New York: Grune & Stratton, 1954.
4. Bleuler, E.: *Lehrbuch der Psychiatrie*, 8th Ed. Berlin: Springer, 1949.
5. Boyd, D. A., Jr.: Mental disorders associated with childbearing. *Am. J. Obst. & Gynec., 43:* 148, 335, 1942.
6. Brew, M., and Seidenberg, R.: Psychotic reactions associated with pregnancy and childbirth. *J. Nerv. & Ment. Dis., 111:* 408–411, 1950.
7. Deutsch, H.: *The Psychology of Women*, Vol. 2. New York: Grune & Stratton, 1954.
8. Douglas, G.: Psychotic mothers. *Lancet, 1:* 124, 1956.
9. Eissler, K. R.: *The Psychiatrist and the Dying Patient*. New York: International Univ. Press, 1955, p. 77,
10. Escalona, S.: The psychological situation of mother and child upon return from the hospital. In *Problems of Infancy and Childhood*. New York: Josiah Macy Jr. Foundation, 1949, p. 30.
11. Ewald, G.: Die Generationspsychosen des Weibes. In Bumke, O.: *Handbuch der Geisteskranheiten*, Vol. 7. Berlin: Springer, 1928, pp. 118–132.
12. Freud, S.: Some character types met with in psychoanalytic work. In *Collected papers*, Vol. 4. London: Hogarth Press, 1950, pp. 318–344.
13. Frumkes, G.: Mental disorders related to childbirth. *J. Nerv. & Ment. Dis., 79:* 540–552, 1934.
14. Greenacre, P.: *Trauma, Growth and Personality*. New York: W. W. Norton & Co., 1952.
15. Harris, J. S.: Mental disorder associated with childbearing. *Brit. M. J., 1:* 835, 1936.

16. Hemphill, R. E.: Incidence and nature of puerperal psychiatric illnesses. *Brit. M. J. 2:* 1232–1235, 1952.
17. Jacobs, B.: Aetiological factors and reaction types in psychoses following childbirth. *J. Ment. Sc., 89:* 242–256, 1943.
18. James, G. W. B.: Prognosis of puerperal insanity. *Lancet, 228:* 1515, 1935.
19. Jones, E.: Psychology and childbirth. *Lancet, 242:* 695, 1942.
20. Karnosh, L. J., and Hope, J. M.: Puerperal psychoses and their sequella. *Am. J. Psychiat., 94:* 537–550, 1937.
21. Kilpatrick, E. E., and Tiebout, H. M.: A study of psychoses occurring in relation to childbirth. *Am. J. Psychiat., 6:* 145, 1927.
22. Klein, H. R., Potter, H. W., and Dyk, R.: *Anxiety in Pregnancy and Childbirth.* New York: Hoeber, 1950.
23. Linn, L.: The psychoses of pregnancy. *Dis. Nerv. System, 2:* 290–295, 1941.
24. Linn, L., and Polatin, P.: Psychiatric problems of the puerperium from the standpoint of prophylaxis. *Psychiatric Quart., 24:* 375–384, 1950.
25. Macdonald, J.: Puerperal insanity. *Am. J. Insan. 4:* 113–163, 1847.
26. McDermaid, W., and Winkler, E. G.: Psychopathology of infanticide. *J. Clin. & Exper. Psychopath., 16:* 22–41, 1955.
27. Ordway, M. D., and McIntire, A. M.: Mental disorders associated with pregnancy and the puerperium. *New England J. Med., 226:* 969–974. 1942.
28. Parfitt, D. N.: Psychoses associated with childbirth. *J. Ment. Sc., 80:* 43–57, 1934.
29. Polonio, P., and Figueiredo, M.: On the structure of mental disorders associated with childbearing. *Monatschr. Psychiat. u. Neurol., 130:* 304–319, 1955.
30. Runge, W.: Die Generationspsychosen des Weibes. *Arch. Psychiat., 48:* 545–690, 1911.
31. Saunders, E. B.: Association of psychoses with the puerperium. *Am. J. Psychiat., 8:* 669, 1929.
32. Seidenberg, R., and Harris, L.: Prenatal symptoms in postpartum psychotic reactions. *Psychiatric Quart., 23:* 715–719, 1949.
33. Shaiova, C., and Chermak, M.: Studies in infanticide in psychotic women. *Arch. Neurol. & Psychiat., 66:* 655, 1951.
34. Smalldon, J. R.: A survey of mental illness associated with pregnancy and childbirth. *Am. J Psychiat., 97:* 80–101, 1940.
35. Strecker, E., and Ebaugh, F.: Psychoses occurring during the puerperium. *Arch. Neurol. & Psychiat., 15:* 239–252, 1926.
36. Victoroff, V. M.: Dynamics and management of para-partum neuropathic reactions. *Dis. Nerv. System, 13:* 291, 1952.
37. Zilboorg, G.: The dynamics of schizophrenic reactions related to pregnancy and childbirth. *Am. J. Psychiat., 8:* 733–770, 1929.
38. Zilboorg, G.: Depressive reaction related to parenthood. *Am. J. Psychiat., 10:* 927–962, 1931.
39. Zilboorg, G.: *A History of Medical Psychology.* New York: W. W. Norton & Co., 1941.

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AROMATIC METABOLISM IN SCHIZOPHRENIA

I. Statistical Evidence for Aromaturia[1]

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Introduction

The frequent familial incidence of schizophrenia (14), the numerous though inconsistent minor physiological abnormalities that have been found, and certain of the clinical features have all been thought to point to the organic nature of the disease. Research workers, therefore, have long sought some constant biochemical abnormality which might play a fundamental role in the disease process. Some, believing the disorder to be one of endocrine dysfunction, have looked for abnormalities in the basal metabolic rate, in radioactive iodine uptake by the thyroid gland, in the ratio of adrenaline to nor-adrenaline output, or in alpha-keto steroid excretion (4). Others, suspecting a primary liver disorder, have looked for abnormal responses to liver function tests such as the benzoic acid detoxication (Quick) test (16). Still others, believing that some endogenous psychotoxin is produced in schizophrenia, have attempted to demonstrate the toxicity of schizophrenic body fluids to plant seedlings, tadpoles, cell cultures and similar organisms (5). The variable results obtained by numerous investigators in all of these tests, as well as in such empirical tests as the Buscaino reaction (10), suggest that if some biochemical abnormality fundamental to schizophrenia exists, it is a subtle one, frequently cloaked by factors of individual variability, diet or generalized stress. Moreover, there is the probability that the term schizophrenia embraces a variety of related diseases, each with its distinctive physiological and biochemical characteristics. Nevertheless, studies of the biochemical abnormalities manifested by schizophrenics still seem worthwhile in an approach to an understanding of the schizophrenic syndrome.

The literature offers promising leads along several different chemical lines. One of these concerns the general area of aromatic metabolism. Young *et al.* (19) in 1951 reported chromatographic studies on 21 individuals which indicated the presence of more diazo-coupling compounds in the urine of schizophrenics than appear in the urine of normals. McGeer *et al.* (11) in a study of 104 cases confirmed the quantitative nature of Young's findings but found that the unidimensional chromatographic technique failed to establish any qualitative difference. Sano (18) studied over 1,500 samples from mental patients and found that the average urinary excretion of indican by schizophrenics was abnormally high. Riegelhaupt (17), using the Hopkins-Cole test for tryptophan derivatives on the urine of 65 schizophrenics and 67 non-schizophrenics, recently reported the test positive in 78 per cent of the schizophrenics. In 1931 Brice (2) used a similar test and found a high incidence of tryptophanuria in mental disease as well as in certain medical cases, but unfortunately he did not categorize the mental patients as to type. Russian workers reported abnormally high concentrations of phenols in the blood and CSF of schizophrenics (7, 15). They regard the phenol levels as of both diagnostic and prognostic value, a decrease to normal levels during therapy indicating a good prognosis for the patient. Miles, on the other hand, found no abnormality in the content of tyrosine and its immediate derivatives in the blood sera from 32 chronic schizophrenics (13). A number of papers appeared about 25 years ago which also indicated a high incidence of aromaturia and aromatemia in schizophrenia (cf. table 1). Although these workers investigated relatively few cases, they usually found the quantitative abnormality in over 70 per cent of acute cases of schizophrenia, with a somewhat lower incidence in chronic schizophrenics.

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TABLE 1.—WORKERS REPORTING EVIDENCE FOR AND AGAINST AN ABNORMALITY IN AROMATIC METABOLISM IN SCHIZOPHRENIA

Author*	Country and Year	Body Fluid Examined	Test Used	No. Cases
a) *For:*				
Scheiner	Italy (1927–29)	Urine	Millon's test	—
Gullotta	Italy (1929–30)	Urine	For indican and skatole	25
		Blood	For indole	25
		Blood	Xanthoproteic reaction	29
Noto	Italy (1930)	Blood, urine and CSF	For aromatics	20
Brice	U. S. A. (1930)	Urine	Crude Hopkins-Cole test	101
Claude *et al.*	France (1930–32)	Urine	Phosphotungstic acid test	9
Lingjarde	Norway (1933)	Urine	Millon's test and for indican	—
Munkvad	—	Blood	For "benzene-soluble amines"	50
Colucci	Italy (1937)	Blood	For indole	—
Tomesco *et al.*	Italy (1936)	Blood	For tyrosine derivatives	15
Fasanaro and Longo	Italy (1937–38)	Blood	For indoles	44
Tinelli	Italy (1945–47)	Urine and CSF	For aromatics	45
Young *et al.*	U. S. A. (1951)	Urine	Chromatographic for diazo-coupling compounds	21
Gorvakova	Russia (1953)	CSF	For phenols	—
Sano	Japan (1954)	Urine	For indican-like materials	866
Poroshina	Russia (1955)	Blood	Benedict-Theis method	244
McGeer *et al.*	Canada (1956)	Urine	Chromatographic for diazo-coupling compounds	104
Riegelhaupt	England (1956)	Urine	Hopkins-Cole test	132
b) *Against:*				
Furth and Scholl	Germany (1931)	Urine	For ether-insoluble phenols	19
Miles	U. S. A. (1955)	Blood	Tyrosine by colorimetric technique	32
Haverback *et al.*	U. S. A. (1956)	Urine	For 5-hydroxyindoleacetic acid	4

* Cf. citations by Buscaino (3) for references not listed in this paper.

The common denominator in these seemingly diverse studies is the abnormally high concentration of various aromatic derivatives in the body fluids of schizophrenics. This phenomenon is of particular interest today when there is so much intensive investigation of the neuropharmacologic properties of those aromatic compounds which act as either hallucinogenic or tranquillizing agents. Accordingly, a broad investigation has been launched in this laboratory into the many aspects of aromatic metabolism in schizophrenia. This paper deals with statistical differences between schizophrenics and non-schizophrenics in the quantities of aromatic compounds excreted in urine as revealed by unidimensional chromatograms.

EXPERIMENTAL METHODS

Selection of samples. In order to study a broadly representative, unselected group of mental patients, an overnight urine specimen was obtained from each new admission to the Crease Clinic during a four-month period. All the patients were receiving the standard hospital diet, but it was not possible to take into account their individual dietary habits. None was receiving shock therapy or tranquillizing drugs. Normal urine samples for comparative purposes were obtained from the staff of the Crease Clinic, from students at the University of British Columbia, and from members of the Royal Canadian Air Force. Overnight urine was employed in every case since such urine would represent the excretion during fasting hours and at rest, and would show less variation in specific gravity than daytime samples.

The chemical tests were performed and rated before any information was obtained concerning the mental status of the people involved. The clinical diagnoses were taken from the hospital files and, as discussed later, are

not necessarily unequivocal. The Crease Clinic is a hospital for patients with acute psychiatric illnesses, and patients remain there for four months at most. Therefore in most cases these diagnoses were made on patients whom the doctors had not had an opportunity to study extensively.

The chemical tests consisted of: a) Chromatographic procedure, b) Sano's tests.

a) *Chromatographic procedure.* A slight modification of our previously described chromatographic procedure (11) was employed since it seemed to yield clearer colored areas; 0.05 ml. of urine was used for each descending unidimensional chromatogram. The chromatograms were run for approximately 18 hours in a n-butanol/acetic acid/water (4:1:1) solvent system. They were then dried in air and the color developed by using a spray made up of equal volumes of 0.3 per cent diazotized sulfanilic acid and 10 per cent sodium carbonate. The freshly prepared diazonium salt was mixed with the base just before spraying. The chromatograms were rated as previously described, one point being given for a faint area, two for a moderately strong area, and three for a very intense area.

b) *Sano's tests.* Sano (18) reported application of the following three tests to urine: (i) the cold Millon's, (ii) the Davis, and (iii) the Mitsuba reactions. Sano gave each urine a rating of 0 to 3 on each test, depending on the intensity of the positive reaction. Using the sum of the ratings on the various tests, he showed that schizophrenics as a class were somewhat more positive than normals or than patients with other types of mental illness (fig. 4). The only categories he found to average as high as the schizophrenics were persons with advanced tuberculosis or with liver disease. Sano believed that the cold Millon's test is specific for indican (indoxyl sulfate), and that the other tests detect similar indole derivatives.

Experimental Results

a) *Chromatographic procedure.* The average ratings and numbers of colored areas found using the above chromatographic procedure are tabulated in table 2 for the various types of cases examined. The average rating for 109 schizophrenics was 8.1 $\pm$ 0.3, for 315 non-schizophrenic patients 5.0 $\pm$ 0.2, and for 223 normals 5.0 $\pm$ 0.1. Thus schizophrenics appear to excrete a higher than normal concentration of aromatic compounds; the data are significant at better than the 0.001 level. No significant differences were found between the recognized subtypes within the schizophrenic group (i.e., simple, hebephrenic, catatonic and paranoic). All showed abnormally high ratings. Normal and non-schizophrenic females seem to excrete less aromatic compounds than do the corresponding groups of males (4.0 $\pm$ 0.3 and 4.5 $\pm$ 0.2 as compared with 5.3 $\pm$ 0.2 and 6.1 $\pm$ 0.3, respectively), while schizophrenic females seem to excrete slightly more than schizophrenic males (8.7 $\mp$ 0.5 as compared with 7.8 $\mp$ 0.3). The difference between the average ratings for normal and non-schizophrenic females is not significant at the 0.1 level. There is an apparent difference between the average ratings for normal and non-schizophrenic males (significant at the 0.05 level), but, as will be discussed later, this may well be due to clinical diagnostic error in some of the non-schizophrenic cases.

Figure 1 shows distribution curves for chromatographic rating vs. the percentage of people with that rating in the various diagnostic categories. It is obvious not only from the statistics but also from the curves in figure 1 that the schizophrenics as a group may be separated from the non-schizophrenics. The overlap of the curves, however, shows that in individual cases there will often be conflict between the biochemical results and clinical judgment. In figure 1, a dividing line has been arbitrarily drawn at a rating of 7+. Twelve per cent of normals and 24 per cent of non-schizophrenics scored over 7, while 29 per cent of schizophrenics scored 7 or under. One important factor known to contribute to the overlap of the schizophrenic and non-schizophrenic groups is the day-to-day variation in the aromatic excretion pattern of each individual. This is illustrated in figure 2 which is a graph of chromatographic ratings vs. consecutive days for a schizophrenic (solid line) and a normal (dashed line). The daily variation is such that the normal individual occasionally has a rating over 7, while the schizophrenic sometimes has a rating under 7. We have yet to find, however, in the many cases which we have examined, a normal individual in good health and maintaining weight whose urine

TABLE 2.—TABLE CHROMATOGRAPHIC RATINGS

Type of Patient	Number of Patients Rated			Average Rating ± Standard Error			Average No. of Spots ± Standard Error			Number (and Percentage) with Rating		Number (and Percentage) with Number of Spots	
	Male	Female	Total	Male	Female	Total	Male	Female	Total	≥ 7.5	< 7.5	> 6	≤ 6
Involutional depression	1	3	4	4 ± 0	3.16 ± 1.0	3.4 ± 0.8	4 ± 0	3.2 ± 1.0	3.4 ± 0.8	0 (0%)	4 (100%)	0 (0%)	4 (100%)
Alcoholism	13	4	17	7.2 ± 0.9	5.4 ± 1.47	6.8 ± 0.8	5.6 ± 0.7	4.7 ± 1.2	5.3 ± 0.6	7 (41%)	10 (59%)	7 (41%)	10 (59%)
Brain injuries, organic dis.	11	4	15	5.6 ± 1.2	2.5 ± 1.6	4.8 ± 1.0	4.2 ± 0.8	2.4 ± 1.4	3.7 ± 0.7	4 (27%)	11 (73%)	4 (27%)	11 (73%)
Personality disorder, schizoid reaction	8	0	8	9.4 ± 0.9	—	9.4 ± 0.8	6.6 ± 0.6	—	6.6 ± 0.6	8 (100%)	0 (0%)	4 (50%)	4 (50%)
Personality disorder, other	19	9	28	5.2 ± 0.8	4.4 ± 1.1	4.9 ± 0.6	4.3 ± 0.6	3.7 ± 0.9	4.1 ± 0.5	8 (29%)	20 (71%)	8 (29%)	20 (71%)
Epilepsy	4	9	13	6.4 ± 0.4	3.9 ± 0.6	4.6 ± 0.6	4.9 ± 0.4	3.5 ± 0.6	3.9 ± 0.5	1 (8%)	12 (92%)	0 (0%)	13 (100%)
Psychotic depression	10	20	30	7.9 ± 0.7	4.3 ± 0.7	5.4 ± 0.6	6.3 ± 0.5	3.7 ± 0.5	4.5 ± 0.5	8 (27%)	22 (73%)	5 (16%)	25 (84%)
Conversion reaction	3	9	12	8.1 ± 1.4	4.9 ± 1.2	5.8 ± 1.0	6.5 ± 0.8	4.0 ± 1.0	4.6 ± 0.9	3 (25%)	9 (75%)	2 (17%)	10 (83%)
Manics	11	11	22	5.2 ± 0.6	4.2 ± 0.7	4.7 ± 0.5	4.6 ± 0.3	4.0 ± 0.4	4.3 ± 0.5	1 (4.6%)	21 (95.4%)	6 (27%)	16 (73%)
Paranoids	4	3	7	7.0 ± 1.9	3.0 ± 0.8	5.3 ± 1.3	5.2 ± 1.2	2.3 ± 0.9	3.9 ± 0.9	2 (28.5%)	5 (71.5%)	2 (29%)	5 (71%)
Anxiety reaction	14	28	42	4.9 ± 0.7	5.0 ± 0.4	5.0 ± 0.4	3.9 ± 0.6	4.4 ± 0.4	4.3 ± 0.3	9 (21%)	33 (79%)	6 (14%)	36 (86%)
Reactive depressives	7	47	54	4.4 ± 1.5	4.5 ± 0.5	4.5 ± 0.5	3.5 ± 0.9	3.7 ± 0.4	3.7 ± 0.3	12 (22%)	42 (78%)	9 (17%)	45 (83%)
Neurotic depressives	12	51	63	6.7 ± 1.1	4.7 ± 0.4	5.1 ± 0.4	5.0 ± 0.7	4.1 ± 0.3	4.3 ± 0.3	15 (24%)	48 (76%)	12 (19%)	51 (81%)
Total non-schizophrenic mental patients	117	198	315	6.1 ± 0.3 σ = 3.3	4.5 ± 0.2 σ = 3.0	5.0 ± 0.2 σ = 3.1	4.7 ± 0.2 σ = 2.4	3.9 ± 0.2 σ = 2.3	4.2 ± 0.1 σ = 2.3	78 (24%)	237 (76%)	65 (21%)	250 (79%)
Normals	174	49	223	5.3 ± 0.2 σ = 2.3	4.0 ± 0.3 σ = 2.0	5.0 ± 0.1 σ = 2.2	4.6 ± 0.1 σ = 1.7	3.2 ± 0.3 σ = 1.6	4.3 ± 0.1 σ = 1.7	26 (12%)	197 (88%)	21 (10.7%)	202 (89.3%)
Schizophrenics	67	42	109	7.8 ± 0.3 σ = 2.5	8.7 ± 0.5 σ = 3.0	8.1 ± 0.3 σ = 2.7	5.8 ± 0.2 σ = 1.6	6.7 ± 0.3 σ = 1.7	6.2 ± 0.2 σ = 1.7	77 (71%)	32 (29%)	48 (44%)	61 (56%)

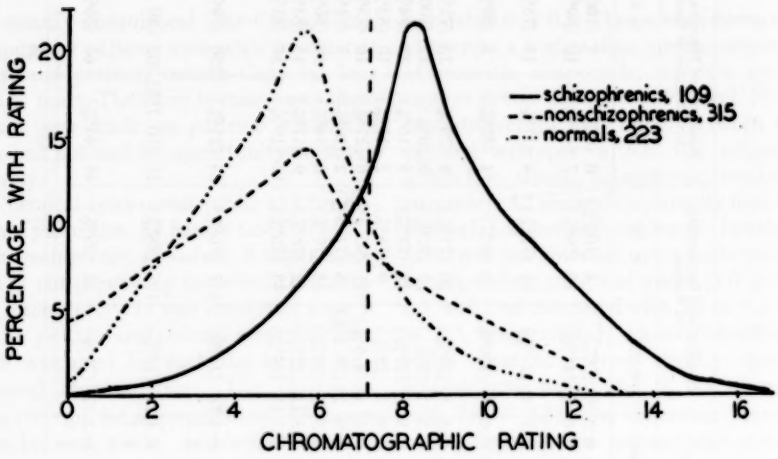

FIG. 1: Distribution of chromatographic ratings.

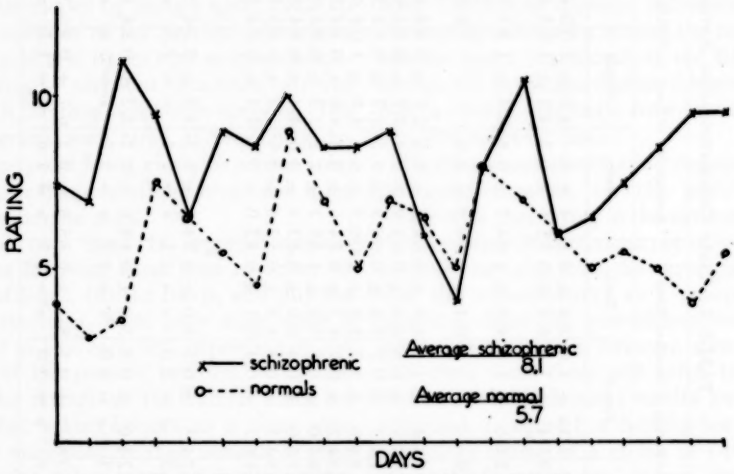

FIG. 2: Plot of chromatographic ratings against time.

consistently gave a chromatographic rating over 7.

An analysis of the frequency of occurrence of each colored chromatographic area in the schizophrenic and non-schizophrenic groups indicates that there is no colored area which appears to be specific for schizophrenics (figure 3). The greatest differences appear to be in the R_f regions 0.12–0.25, 0.40–0.6 and 0.7–0.9 which, in general, confirms previous findings (11). The R_f values and frequencies shown for each colored area are only approximate since the R_f of a given area varies somewhat depending on the salt concentration of the urine and other factors. Furthermore there may often be some difficulty in distinguishing overlapping areas. More exact information may be hoped for from chromatographic work with salt-free urine extracts. Bidimensional chromatograms run on such extracts indicate that each of the colored areas particularized for unidimensional chromatograms can be resolved into a number of distinct spots (12).

The excretion of excessive amounts of certain aromatic metabolites has been reported to occur in a variety of diseases including vitamin deficiencies, liver disease, anemias, and malignant neoplasms. We are therefore studying chromatographically the urine of a variety of medical and surgical patients to determine

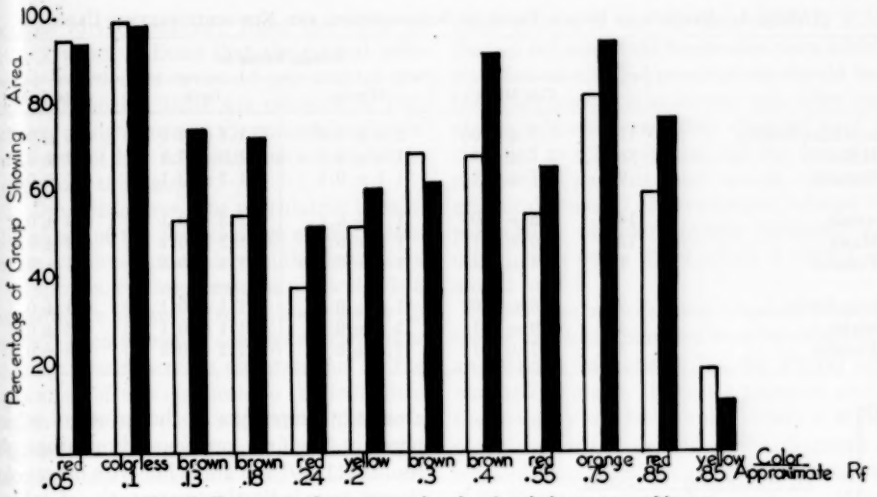

FIG. 3: Frequency of occurence of each colored chromatographic area.
Blank columns = normals + nonschizophrenic mental patients.
Solid columns = schizophrenic mental patients.

TABLE 3.—GENERAL MEDICAL CASES EXAMINED CHROMATOGRAPHICALLY

Diagnosis	No. of Cases	No. with Rating > 7
Toxemia of pregnancy	4	4
Hepatic coma	2	1
Hodgkin's disease	4	1
Cirrhosis	1	1
Acute renal failure	1	1
Diabetes	2	1
Pyelonephritis	2	1
Multiple myeloma	3	0
Carcinoma	25	2
Heart disease	6	0
Pneumonia	2	0
Gastrointestinal hemorrhage	1	0
Hepatitis	2	0
Post partum psychosis	1	0
Obstructive jaundice	1	0
Uremia	1	0
Gout	1	0
Totals	59	12

whether aromatic excretion patterns similar to those found in schizophrenia occur in other diseases. The data obtained to date (summarized in table 3) are as yet too scanty to permit any firm conclusions.

b) *Sano's tests.* Prior to the work of Sano, indicanuria had been reported in schizophrenia both by Lingjarde and Gullotta (3). It also appears in "H disease", a recently recognized hereditary condition apparently involving abnormalities in indole metabolism and progressive mental effects (1, 9). It therefore seemed of interest to apply Sano's tests to some of the urines studied chromatographically. The results on the first 100 of these cases suggested a crude correlation between high Sano ratings and the diagnosis of schizophrenia. Our later results on a total of 396 cases do not bear out these early findings (table 4 and figure 4). There is no significant difference between the average rating for schizophrenics in Sano's tests and those for non-schizophrenics or normals, and there is no correlation between our results using Sano's tests and using the chromatographic procedure.

Our results do indicate a possible difference between schizophrenics and non-schizophrenics in the cold Millon's test. The difference is not as great as that found in the chromatographic procedure and appears to occur only in the male group. The difference, even in this group, is not significant at the 0.1 level. We have confirmed Sano's findings that the cold Millon's reaction is specific for a substance with an R_f of about 0.4 using n-butanol/acetic acid/water (4:1:1) as the developing solvent. We have not shown that the Millon's-positive material is indican, but we have no reason to doubt Sano's findings on this point.

Our ratings on all three tests are generally

TABLE 4.—Results of Sano's Tests on Schizophrenic and Non-schizophrenic Urine

	No. Cases	Average Rating In			
		Cold Millon's	Mitsuba	Davis	Total Sano
Non-schizophrenics	178	1.7 ± 0.06	1.6 ± 0.07	1.1 ± 0.1	4.6 ± 0.2
Males	82	1.7 ± 0.1	1.6 ± 0.1	1.0 ± 0.1	4.4 ± 0.2
Females	96	1.7 ± 0.1	1.7 ± 0.1	1.2 ± 0.1	4.7 ± 0.3
Normals	140	1.6 ± 0.07	1.3 ± 0.1	1.5 ± 0.1	4.3 ± 0.2
Males	124	1.6 ± 0.1	1.3 ± 0.1	1.5 ± 0.1	4.4 ± 0.2
Females	16	1.5 ± 0.2	1.4 ± 0.3	1.4 ± 0.1	4.1 ± 0.6
Schizophrenic	78	1.8 ± 0.02	1.6 ± 0.1	1.1 ± 0.1	4.4 ± 0.3
Males	48	1.9 ± 0.1	1.5 ± 0.1	1.1 ± 0.1	4.3 ± 0.3
Females	30	1.7 ± 0.1	1.6 ± 0.2	1.2 ± 0.1	4.6 ± 0.4

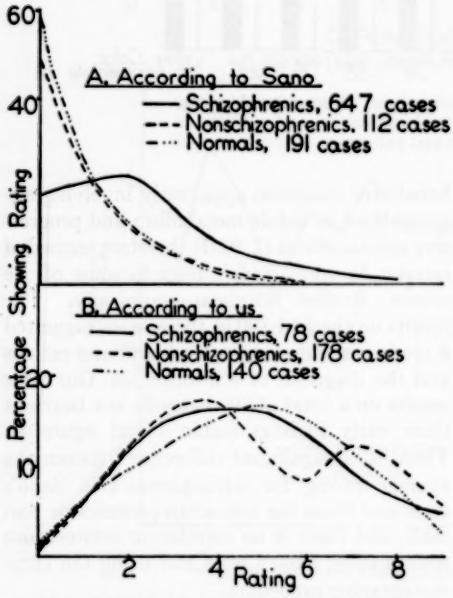

Fig. 4: Distribution curves of Sano's ratings.

higher than those found by Sano. Two obvious possible explanations for this difference are: (a) the difficulty of exactly duplicating semi-quantitative tests from a written description, and (b) probable dietary differences between the Japanese studied by Sano and the North Americans studied by us. Further studies on the quantitative indican excretion in a group of schizophrenic and non-schizophrenic urines are being carried out.

Discussion

The investigations reported here, indicating an abnormally high concentration of activated aromatic compounds in the urines of schizophrenics, confirm previous chromatographic results (11, 19) and are in line with other colorimetric tests indicating aromaturia (cf. table 1) and aromatemia (7, 15). All of these results may be taken as indicators of an aberration in aromatic metabolism, possibly of a rather diffuse nature, in a large percentage of schizophrenics. Such results tend to support the hypotheses which suggest that a metabolic error may lead to the production or accumulation of psychotoxins in schizophrenia, but they by no means prove the psychotoxin hypothesis. Such proof (or disproof) must await further, more rigorous work, possibly along different experimental lines.

The results cited merely indicate that *on the average* schizophrenics excrete more aromatic compounds than do non-schizophrenics. In interpreting the overlap between the curves of figure 1, the following factors must be considered: 1) variability in the individual's day-to-day aromatic excretion, 2) clinical diagnostic error, 3) errors in chromatographic measurement, 4) unknown factors in the schizophrenic process.

1) *Individual variability.* As indicated in figure 2, there is considerable daily variation in the aromatic excretion pattern of both normals and schizophrenics. The data in table 2 show that 12 per cent of the 223 normals examined scored over 7. On examination of new urine specimens in these cases, all scored 7 or under. Thus it seems reasonable to suppose that the inherent daily variation in the excretion pattern was responsible for these high scores in the normal group. This assumption

receives further support from the data in figure 2 which indicate that the normal individual scored over seven 14 per cent of the time. Presumably there are comparable percentages of high scores in the non-schizophrenic group and of low scores in the schizophrenic group from this cause.

2) *Diagnostic error.* The psychiatrist is painfully aware of the shortcomings of his nomenclature which is based solely on the description of symptoms. Schizophrenia in particular is a conglomerate diagnosis to be used warily in research, even though it conveys much clinical meaning. There is often disagreement on the application of this diagnosis to the individual case, even though there is usually a high ratio of agreement over many cases. In this study, the diagnostic evaluation was made by referring physicians and by different psychiatric residents at the Crease Clinic on newly-admitted patients. Since the clinical judgment brought to bear in making these diagnoses must have varied considerably, it seemed desirable for a single clinician to review the files on some of the cases to estimate as far as possible how much the varying clinical opinion could have affected the results.

Accordingly, all patients in two large subgroups of the non-schizophrenics were evaluated by one of us (F.E.M.) without prior knowledge of the biochemical findings. Reanalysis of the files of the 30 cases initially classed as psychotic depressives turned up five cases which, on clinical reevaluation, were classified as schizophrenics. Four of these five scored over 7 by the chromatographic rating. There were four others in this group of psychotic depressives who, although scoring over 7, were not considered to be schizophrenics on reevaluation; one of these four was shown on a later admission to have a low chromatographic rating. In those cases reevaluated as schizophrenic, depression was a dramatic feature of the illness, but delusions of reference, auditory hallucinations, emotional incongruity and an insidious onset of disease pointed to a more malignant process. Thus the psychotic depressive group after reevaluation was reduced from 30 to 25; of these, 4 (16%) still scored over 7. This is approximately the number scoring over 7 which would be expected for reasons of daily variation in the excretion pattern. In reevaluating the clinical files of the personality disorder groups, it was our impression (F.E.M.) that all but one of the borderline cases initially classified as schizoid personalities should have been diagnosed schizophrenic; two other cases of non-schizoid personality disorder were reclassified as schizophrenic. All but one of the reclassified patients had scored chromatographically over 7. Reevaluation reduced the personality disorder groups (schizoid and other) from 36 to 27 of which 8 (29%) still scored over 7.

Much poorer success was obtained when the files of the schizophrenics were reevaluated in an attempt to account for the 29 per cent scoring 7 or under. It became apparent that in the majority of the 32 cases where a schizophrenic scored 7 or under, the diagnosis of schizophrenia was thoroughly justified.

3) *Errors in measurement.* The rating system used is subject to error both from the inherent variability of the chromatographic technique and the subjective judgment of the rater. To estimate the magnitude of these errors a group of 100 urines were run twice and the ratings obtained independently by the same person checked one against the other; agreement was within one rating point in all cases. Individual urines were reexamined from time to time during the experimental period in order to verify the reproducibility of the technique. The rater was ignorant of the diagnoses and of which urines were being restudied, so that bias did not affect the result. Since variation was never greater than one point, it is felt that this is a reasonable estimate of the reproducibility of the method.

The chromatograms prepared as described showed many spots too faint to give an accurate reading on a Photovolt Densitometer. However, 10 chromatograms prepared with concentrated urines were rated as described above, and then the total density along the chromatographic strip was measured with the densitometer; the values obtained by these two techniques had a correlation coefficient of 0.78.[3]

4) *Unknown factors in the schizophrenic process.* There still remains a certain percentage of cases in which the difference between the biochemical results and the clinical classification cannot be accounted for on any of the

[3] We are indebted to Mr. Denis Shalman for carry ing out this correlation study.

above grounds. This is particularly true of schizophrenics with very low scores. These must be attributed to presently unaccounted factors in the schizophrenic process. It is possible that, in cases of schizophrenia, the clinical symptoms persist after the biochemical abnormality has corrected itself. Sano (18), Poroshina (15) and many of the earlier workers found the greatest abnormalities in the initial stages of schizophrenia. The urinary change we have demonstrated may appear only when the patient's defenses are being mustered frantically though ineffectually to combat his disease, later disappearing as the schizophrenic illness moves to remission or chronicity. The biochemical test may represent a "mental sedimentation rate", which reverts to normal when the disease is arrested or has burnt itself out.

A factor which has been considered as a possible contributor to the abnormal excretion of aromatic compounds in schizophrenia is diet. Originally (11), urine samples from a group of 104 females comprising schizophrenics, non-schizophrenics and normals were obtained from the Crease Clinic on the same day. The results from this group with a relatively standardized food intake were in excellent agreement with the results from the much larger group reported in this paper. Because of the makeup of this latter group, the dietary intake probably varied considerably. Thus, while dietary variations might alter some of the finer details of the chromatographic pattern, it would not appear to be responsible for the more important characteristics.

It would be difficult to give an accurate evaluation of the emotional stress being suffered by the individuals studied. However, the chromatographic ratings of the non-schizophrenic group of mental patients showed little variation from those of the normal group even though large differences in emotional tension and anxiety could be expected to exist.

Of immediate significance is the indication that the aromaturia accompaning the acute phase of many cases of schizophrenia could form the basis of a chemical test to act as an aid in the differential diagnosis of schizophrenia. The chromatographic test described here, however, does not fulfill the basic criteria of a simple clinical test. It is at best a semi-quantitative test requiring special equipment and skilled technique. Chromatography, although extremely simple in principle, is quite difficult in practice, especially when anything as complex and variable as human urine is being studied. The chromatographic work does suggest several possibilities for a more quantitative chemical test based on any of several aromatic compounds.

Summary

1. The work of 20 authors who have reported on aromatemia or aromaturia in schizophrenia has been briefly reviewed.

2. The overnight urine of 109 schizophrenics, 315 non-schizophrenic mental patients and 223 normals has been studied chromatographically. The schizophrenics appeared to excrete a higher than normal concentration of aromatic compounds. Based on an arbitrary scale which takes into account the number of colored areas and the intensity of these areas on a unidimensional chromatogram, the schizophrenics have a rating of 8.1 ± 0.3, the non-schizophrenics 5.0 ± 0.2, and the normals 5.0 ± 0.1.

3. The chromatographic rating has been found to vary from day to day for both schizophrenic and normal individuals.

4. The distribution curves of the normal, non-schizophrenic and schizophrenic groups show considerable overlap; this overlap is attributed to: (a) daily variation in the aromatic excretion, (b) diagnostic error, (c) error in measurement, and (d) unknown factors.

5. Diet and emotional stress are not considered to play a dominant role in this aromaturia.

BIBLIOGRAPHY

1. Baron, N. D., *et al.*: *Lancet, ii:* 421–428, 1956.
2. Brice, A. T.: *Arch. Int. Med., 46:* 778–781, 1930; *49:* 978, 1932.
3. Buscaino, M. V.: Proc. 1st Intern. Congress of Neuropathology, Rome, Sept. 8–13, 1952.
4. Cranswick, E. H.: *Am. J. Psychiat., 112:* 17–78, 1953; Faurbye, A.: *Acta psychiat. et neurol. scandinav., 30:* 665–686, 1955; Hoaglund, H., *et al.*: *Arch. Neurol. & Psychiat., 69:* 470, 1953; Reiss, M., and Stitch, S. M.: *J. Ment. Sc., 100:* 704–710, 1954; Simpson, S. L.: *Colloquia on Endocrinology, III:* 120–127, 141–153, 1952.
5. Edisen, C. D.: *Dis. Nerv. System, 17:* 77–80, 1956; Federoff, S.: *J. Lab. & Clin. Med., 48:* 55–62, 1956; Fischer, R.: *Science, 118:* 409–410, 1953; idem.: *Canad. M. A. J., 74:* 641–643, 1956; Macht, D. I., and Kremen, D.: Federation Meeting, April, 1956, Abstract #397; Macht, D. I., and Lubin, D. S.: *J. Pharmacol. & Exper. Therap., 22:* 413–466, 1924; Shapiro, A. K.: *J. Nerv. & Ment. Dis., 123:* 65, 1956.

6. Furth, O., and Scholl, R.: *Biochem. Zeitschr., 243:* 274–291, 1931.
7. Gorvakova, T. M.: *Voprozy Fiziol., 4:* 211–218, 1953; *Referat. Zhur. Khim. Biol. Khim.*, 1955, #8704; *Chem. Abstracts, 50:* 6652i.
8. Haverback, B. J., *et al.*: *New England J. Med., 255:* 270–272, 1956.
9. Jepson, J. B.: *Biochem. J., 64:* 14P, 1956.
10. Katzenelbogen, S.: *Am. J. Psychiat., 8:* 1021–1043, 1929.
11. McGeer, P. L., *et al.*: *Science, 123:* 1029, 1078–1080, 1956.
12. McGeer, E. G., *et al.*: *J. Nerv. & Ment. Dis.* (In press).
13. Miles, J. E.: *J. Nerv. & Ment. Dis., 122:* 195, 1955.
14. Planansky, K.: *J. Nerv. & Ment. Dis., 122:* 121-142, 1955.
15. Poroshina, A. A.: *Zhur. nevropat. i psikhiat., 55:* 266–268, 1955.
16. Quastel, J. H., and Wales, W. T.: *Lancet, 1938ii:* 301; *1940i:* 402; Struwe, F. E.: *Nervenarzt, 27:* 25–28, 1956; Trew, A., and Fischer, R.: *Lancet, 1955i:* 402.
17. Riegelhaupt, L. M.: *J. Nerv. & Ment. Dis., 123:* 383–385, 1956.
18. Sano, I.: *Folia Psychiat. & Neurol. Japonica, 8:* 219–231, 1954.
19. Young, M. K., Jr., *et al.*: Univ. of Texas Publ. #5109, pp. 189–197, 1951.

AROMATIC METABOLISM IN SCHIZOPHRENIA

II. Bidimensional Urinary Chromatograms[1]

EDITH GRAEF McGEER, WILLIAM T. BROWN AND PATRICK L. McGEER[2]

A previous study reported from this laboratory of the urinary excretion of activated aromatic compounds by over 700 individuals using a unidimensional chromatographic technique has shown that schizophrenics as a group excrete abnormally large quantities of such compounds (3, 4). Such concentrations of aromatic derivatives in the urine, blood and CSF of schizophrenics have also been found by investigators in Russia, England, Japan, Italy, Scandinavia and the United States (4). While most investigators report aromaturia and aromatemia in at least 75 per cent of acute cases of schizophrenia, this abnormality seems to be far less common in chronic schizophrenics. The phenomenon is especially deserving of further exploration because it is in the general area predicted by the various "hallucinogenic" hypotheses of the schizophrenic process which suppose that some upset in aromatic metabolism is responsible for the development of psychotic symptoms. It seems necessary to determine whether the abnormality of aromatic metabolism in schizophrenia is qualitative as well as quantitative. So far no definite evidence for the production of any "abnormal" compound or compounds in schizophrenia has been forthcoming.

As a first step in such further exploration it was decided to prepare bidimensional chromatograms of comparable extracts of representative samples of schizophrenic and non-schizophrenic urine. Such chromatograms should provide a check on the statistical results previously reported (4) and should give some indication as to whether schizophrenics actually excrete "abnormal" aromatic compounds or merely a higher concentration of the compounds found in normal urine.

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Selection of Urine Samples

Our previous unidimensional chromatographic studies indicated an appreciable variation in the aromatic excretion pattern from day-to-day in any single individual and from individual to individual in any single diagnostic group. It was apparent, therefore, that if bidimensional chromatograms were to be prepared using individual urines, a rather large number would be necessary before the results could be considered representative. An alternative procedure for obtaining the average result sought was to pool the urines of a number of individuals within each of the appropriate diagnostic groups.

Twenty milliliters of overnight urine were collected from a number of individuals comprising five distinct categories. These categories (and the number in each) were: normals, 35; acute schizophrenics, 29; nonschizophrenic mental patients, 30; debilitated schizophrenics, 25; and phenylketonurics, 17. A nonschizophrenic is a person suffering from some mental disorder other than schizophrenia or phenylketonuria. A debilitated schizophrenic is a chronic schizophrenic unsuitable for life on an open ward. Samples from schizophrenic and non-schizophrenic mental patients were obtained from the B.C. Provincial Mental Hospital at Essondale, and the diagnostic classifications were provided by Dr. R. Halliday of that hospital. The phenylketonuric samples were obtained from the Woodlands School for Mentally Retarded Children at New Westminster, B.C. Normal samples were obtained from staff members of the Department of Neurological Research and from medical students at the University of B.C. Each group was composed of approximately equal numbers of men and women. No one in any group was under medication at the time the sample was obtained. Equal volumes of the individual urines in each category were combined. The pools were acidified to pH 3.0 and adjusted to an arbitrary specific gravity of 1.023.

Preparation of Extracts

Preliminary work had shown that solvent extraction of urine with ether or ethyl acetate even at acid pH and under conditions of salt saturation removed only a portion of the diazo-coupling compounds. Furthermore, those extracted appeared to be chiefly in the high R_f regions (in butanol/acetic acid/water, 4:1:1), whereas those appearing in the low and intermediate R_f regions appear to be of greater importance in distinguishing between schizophrenics and non-schizophrenics. Most diazo-coupling compounds, however, were adsorbed from acidified urine by animal charcoal, and the majority appeared to be recovered on elution with phenol-saturated water (2); this procedure was therefore adopted for the preparation of the extracts.

Four hundred milliliters of each urine pool were added to 20 gm. of Baker and Adamson decolorizing carbon and stirred continuously for 1 hour. The charcoal was washed with water before use. The mixture was filtered and the colorless, chromatographically diazonegative filtrate was discarded. The charcoal was periodically stirred for 8 hours with 70 ml. of phenol-saturated water. Baker and Adamson crystalline phenol was used without further purification in the preparation of the phenol-water eluant. After filtration, the charcoal was washed with 50 ml. of water and the washing added to the intense yellow phenolic solution. The phenol was taken off under vacuum at room temperature. The solution was concentrated to a final volume of 2 ml. Aliquots of this were used for chromatographic purposes.

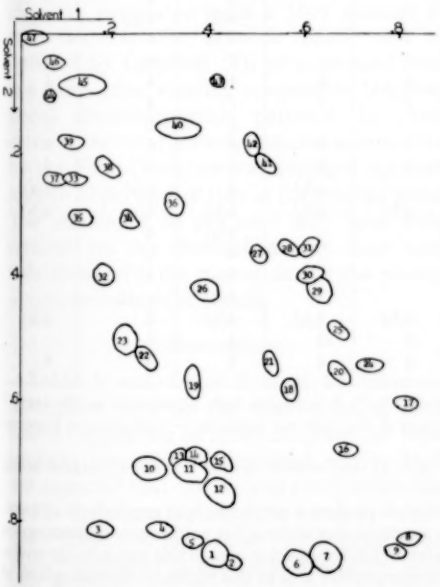

Fig. 1: Bi-dimensional chromatographic map.

Preparation of Chromatograms

Initial bidimensional chromatographic studies were carried out using various combinations of the following solvent systems: butanol/acetic acid/water (4:1:1); organic phase of butanol/pyridine/saturated sodium chloride (1:1:2); butanol/ammonium carbonate buffer; water-saturated methyl ethyl ketone; isopropanol/ammonia/water (8:1:1); organic phase of benzene/propionic acid/water (2:2:1); and 20 per cent potassium chloride. The most clear-cut resolution seemed to be obtained using the isopropanol/ammonia/water system in the first dimension and the n-butanol/acetic acid/water system in the second dimension. This combination was therefore adopted for the descending chromatographic work reported here. The extracts were chromatographed repeatedly at a series of spotting concentrations (4–10 λ). All chromatograms were examined under an ultraviolet "Mineralite"; most were then sprayed with a 1:1 mixture of diazotized sulfanilic acid and 10 per cent sodium carbonate (4). Duplicate chromatograms of each extract were sprayed with Ehrlich reagent (2 per cent p-dimethylaminobenzaldehyde in 1:1 ethanol-concentrated hydrochloric acid) or with ammoniacal silver nitrate. Only those spots are reported which appeared consistently and were not artifacts of the chromatographic procedure.

Chromatographic Results

Chromatograms prepared with 4 λ of the acute or debilitated schizophrenic extracts showed at least 10 spots which did not appear in the chromatograms of the normal or non-schizophrenic extracts even when 10 λ were spotted. These spots therefore seem to correspond to "abnormal" compounds which either do not appear in normal urine or appear at much lower concentrations. The chromatograms of the non-schizophrenic extract showed four spots which appeared in the schizophrenic

TABLE 1.—DIAZO-POSITIVE SPOTS IN URINARY CHROMATOGRAMS

Spot No.	Color with Diaz. Sulfanilic Acid	Fluorescence*	Mean R_f (s) in system†		Appears in Extract of Urine From‡				
			No. 1	No. 2	Normals	Non-schiz.	Acute Schiz.	Debil. Schiz.	Phenylketonurics
1	Red	−	0.42	0.85	4	4	4(a)	4(a)	4(a)
2	Yellow	−	0.46	0.86	4	4	4	8	
3	Yellow	+	0.19	0.81	4	4	4	4	
4	Yellow	+	0.31	0.81	4	4	4	4	
5	Yellow	?	0.37	0.83	4	6	8		
6	Orange	−	0.59	0.86			8		4
7	Orange	−	0.66	0.85					4
8	Yellow	P	0.83	0.82					6
9	Red	?	0.80	0.84			6		?
10	Orange	−	0.29	0.71	8	4	4	4	4(b)
11	Orange	P	0.37	0.71	4	4	4	4	4(a)
12	Orange	−	0.44	0.75	4	4	4	4	4(a)
13	Red	−	0.35	0.70		(a)	6(a)	(a)	(a)
14	Red	−	0.37	0.70		(a)	4(a)	(a)	(a)
15	Red	−	0.43	0.70					6(a)
16	Red	−	0.69	0.68		(b)	4	8(a, b)	
17	Red	−	0.82	0.60	8	?	4	8	4
18	Red	−	0.57	0.58			4	4	4
19	Red	−	0.37	0.57			4(b)	6(b)	?(b)
20	Yellow	P	0.67	0.55					6
21	Brown	?	0.53	0.54			6	?	6
22	Red	?	0.27	0.53			4		
23	Red	−	0.23	0.50	?	4	4	4	4
24	Red	?	0.74	0.54			?	4	4
25	Yellow	−	0.68	0.48			4	4	4
26	Yellow	P	0.40	0.42	?(b)	?	6(b)	4(b)	6(b)
27	Yellow	−	0.51	0.36	?	8	6(a)	6(a)	
28	Yellow	?	0.57	0.35		4	4	6	
29	Yellow-orange	−	0.63	0.42	4	4	4	4	6
30	Yellow-orange	P	0.61	0.40			4	4	4
31	Yellow	+	0.62	0.35			6(a)	4(a)	4(a)
32	Yellow	P	0.19	0.40			4(b)	4(b)	
33	Red	−	0.12	0.24			4	4	8
34	Red	−	0.24	0.31	4	4	4	4	4
35	Yellow	−	0.13	0.30	?	?	?	4	?
36	Red	?	0.33	0.28			6	6	6
37	Yellow	?	0.07	0.24		?	8	6	4
38	Red	?	0.19	0.22	4	4	4	4	4
39	Red	?	0.11	0.18		4(b)	4	6(a)	?(a)
40	Yellow	−	0.34	0.16	4(b)	4(b)	4(b)	4(b)	4(b)
41	Red	−	0.51	0.21			4(a)	4	
42	Red	P	0.50	0.19			4	4	
43	Red	−	0.42	0.08			8	4	
44	Yellow	−	0.07	0.10		(a)	?(b)	(a, b)	
45	Red	−	0.13	0.09	4(b)	4(b)	4(b)	4	4(a)
46	Yellow	−	0.07	0.05	8	10	4	6	
47	Brown	+	0.06	0.02	6	4	8	4	8

* + indicates light fluorescence in this area under "Mineralite"; P indicates dark absorption in the area; ? indicates different responses to light in various chromatograms of the different extracts; − indicates no response to light in the area.

† Solvent system no. 1 is isopropanol/ammonia/water (8:1:1), and solvent system no. 2 is n-butanol/acetic acid/water (4:1:1).

‡ The figure 4, 6, 8 or 10 indicates the number of λ spotted to produce a particular spot regularly in chromatograms of the indicated extract. A ? indicates that the spot appeared several times but not in every chromatogram of the extract at any definite spotting centration; (a) indicates an Ehrlich-positive area in this region in chromatograms of the indicated extract; and (b) indicates a silver nitrate-positive area in this region in chromatograms of the indicated extract.

but not in the normal extract. All of the diazo-coupling compounds appearing in the normal extract were also in the schizophrenic and non-schizophrenic extracts. The intensity of the spots in the normal extract was comparable or even slightly greater than in the other extracts.

The chromatograms of the phenylketonuric extract showed four unique spots as well as 10 of the spots appearing otherwise only in the schizophrenic extracts. The phenylketonuric extract was also peculiar in that six of the "normal" diazo-coupling compounds were missing.

A map of the diazo-coupling compounds found in these chromatograms is shown in figure 1; the appearance or non-appearance of each spot in chromatograms of the various extracts is indicated in table 1. The R_f(s) indicated in figure 1 are average values. The number of determinations for each reported R_f ranged from a minimum of six for those spots appearing in only one extract to a maximum of over thirty for those appearing in all five extracts. Reproducibility of R_f values between one chromatogram and another was generally within 0.08 R_f units for solvent 1 and 0.06 R_f units for solvent 2.

Comparative experiments using the same charcoal, pretreated with a 10:1 mixture of ethanol-acetic acid or with stearic acid as outlined by Dalgliesh (2), gave extracts from the same urine showing comparable bidimensional chromatographic patterns. In these extracts the total phenolic content as measured by the Folin-Denis method averaged approximately 70 per cent of that in the original urine. The remaining 30 per cent may have been retained on the charcoal or may have been volatilized with the phenol during the process of concentrating the eluant.

Discussion

Table 1 and figure 1 must be taken as descriptive only of the diazo-coupling compounds appearing in chromatograms of urine extracts prepared as described above. It is not expected that the urine of every individual in the appropriate diagnostic category would show those and only those "chromatographic spots" indicated in the table. However, work with five other extracts of pooled acute schizophrenic urine and one other extract of pooled normal urine, prepared by the technique described above, indicates that the data given in table 1 are quite representative of such extracts. The debilitated chronic schizophrenic extract, on the other hand, is not believed to be representative of all chronic schizophrenic extracts. As indicated in much of the literature and by work at this laboratory which will be reported later, many chronic schizophrenics who are "adjusted" to their disease fail to show the same florid aromaturia appearing in most acute and debilitated schizophrenics.

In some areas such as spot no. 1, chromatograms of all five extracts appeared similar when developed with diazotized sulfanilic acid and yet appeared quite dissimilar when developed with Ehrlich's reagent or with ammoniacal silver nitrate (cf. table 1). This phenomenon probably indicates the presence of more than one aromatic compound in these chromatographic areas.

Many of the diazo-positive materials of high R_f in the butanol/acetic acid mixture appear to correspond to phenolic acids previously identified by Armstrong (1) in ethyl acetate extracts of urine; examples are spot no. 1 which is presumably p-hydroxyphenylacetic acid and spot no. 11 which is presumably m-hydroxyhippuric acid. Most of the compounds of low R_f in butanol/acetic acid are not extractable into ethyl acetate. Some of these probably correspond to the diazo-positive tryptophan metabolites studied by Dalgliesh (2) using similar extracts of urines from normal and vitamin-deficient animals. However, Dalgliesh has not reported the many diazo-positive compounds which seem to appear in these schizophrenic extracts. Intensive effort at this laboratory is now being devoted to the identification of these urinary components; details of this work will be published when reasonable progress has been made.

One small point which may be mentioned is that the extracts of schizophrenic urine seem to have a distinctive odor. This has been noticed by the two people engaged in the preparation of the extracts and by the neurophysiologist to whom they have been submitted for neurological testing. This odor does not seem to be identical with the phenyl-

ketonuric odor which has been attributed to phenylacetic acid.

The significance of the comparative studies reported here is that they serve to confirm previous quantitative reports of excessive aromatic excretion by schizophrenics. They indicate the possibility that a qualitative difference may exist as well.

BIBLIOGRAPHY

1. Armstrong, M. D., *et al.*: *J. Biol. Chem., 218:* 293-303, 1956.
2. Dalgliesh, C. E.: *Biochem. J., 52:* 3, 1952; Dalgliesh, C. E., and Tekman, S.: *Biochem. J., 56:* 458, 1954; Asatoor, A., and Dalgliesh, C. E.: *J. Chem. Soc., 445:* 2291, 1956.
3. McGeer, P. L., *et al.*: *Science 123:* 1029–1030, 1956.
4. McGeer, P. L., *et al.*: *J. Nerv. & Ment. Dis.* (In press).

THE PSYCHOSOMATIC CONCEPT OF OBESITY[1]

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Obesity is one of the most common abnormalities of our time. Dorfman (21) has estimated that about 30,000,000 people in the United States are to some extent obese, and that they share collectively among themselves the burden of 125 million tons of excessive adipose tissue which if expended in the form of energy would yield 100 billion calories of heat. Today, the American public is so weight conscious that millions of books are being sold on reducing; 15 million cases of low-calorie soft drinks are being ingested annually; the baking, sugar and beer industries are concerned about large decreases in their sales which are apparently related to the emphasis on reducing diets; and the new industry of the dietetic or weight reducing food is booming. The current socio-economic consequences of obesity are almost as profound (81) as are the medical liabilities.

During the past three decades, an increasing number of investigators and clinicians have come to the conclusion that the overwhelming majority of cases of obesity are not caused by any organic disorder of metabolism, as was previously believed by many, but are simply the result of *overeating* (54), which is caused largely by emotional disturbances that abnormally increase the intake of food. Since the somatic condition obesity is thus essentially caused by psychic factors, obesity may be said to be not only the most omnipresent *psychosomatic disorder* but also probably the most significant.

The authors conceive of obesity as an abnormality that is multicausal in origin. As applied to obesity, the concept of multicausality means that while the overeating of the obese patient is predominantly psychogenically determined, disturbances of genetic and biochemical regulatory mechanisms may also be involved to some extent; all of these factors play some role in the disruption of body homeostasis that has as its end result, the state of obesity. The authors propose to review the somatic and psychological determinants that result in the development of obesity, and to evaluate the importance of their respective roles in the genesis of this condition.

Definition. Obesity, according to Newburgh (54), is a condition in which the body contains an abnormally large amount of adipose tissue. When we speak of *obesity*, a general distribution of excessive fat is conceived of as opposed to *lipomatosis* which is a condition characterized by localized accumulations of adipose tissue. Obesity is defined statistically as a 10 to 15 per cent deviation from the ideal body weight (64). *Overweight* is not always synonymous with *obesity*, and one often cannot judge obesity simply by the relationship of an individual's weight and height at a certain age compared with a series of ideal weights. Behnke, Osserman and Welham (6) studied 23 football players who by the standards of weight charts were overweight; they would have been rejected by the Navy or by life insurance companies as obese. In reality, however, these athletes had little fat in their body. Although they weighed too much for their height and age, the specific gravity of their bodies, which was the method used to evaluate their actual fat content, was within the normal range. Their excessive weight was due to their disproportionately large muscle and bone content and their *low* bodily fat content. These heavy men were in actuality *not* obese! Dubois (22) notes that the *normal* percentage of fat content in a person's body may vary with his age; young people usually have 10 per cent of their body weight in fat, and older people 21 per cent. Therefore, in obesity, we must consider each

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case individually from the viewpoint of body build, i.e.; muscle and bone content, age, height, habits of eating and energy expenditure, as well as lifelong patterns of body weight. During the life span of the same individual he may have more fat at one time than at another for normal physiological reasons. For example, so-called pyknic people at middle age when they are settling down to a more contented retirement period normally gain a moderate amount of weight. Bruch (11, a) has designated this latter normal group as *constitutional obesity*, as opposed to *symptomatic obesity* which is uniformly pathological.

The somatic effects of obesity. One of the reasons for the medical profession's current emphasis upon weight reduction is the harmful effect of obesity on the physical health of the individual. In addition, whenever obesity exists in association with some other physical disorder, it invariably has a detrimental effect on the progress and prognosis of the accompanying disease. For example, the following conditions are adversely affected whenever they are associated with obesity: diabetes, heart disease, kidney disease, toxemias of pregnancy, arthritis of the spine and of the lower extremities, atherosclerosis, emphysema, cirrhosis, pulmonary embarrassment, hernia, varicose veins, post-operative thrombosis and embolus, serious accidents, obstetrical and gynecological procedures, etc. *ad infinitum*. Even fetal mortality is higher with obese women. Not only are these disease processes clearly aggravated by overweight, but the accumulation of excessive adipose tissue may play a significant role in the actual production of the conditions. Master, Dublin and Marks (50) showed an increase in blood pressure as body weight increases. Levy, White, Stroud and Hillman (49) demonstrated that men develop high blood pressure two and a half times more frequently when they are obese. Overweight persons also show significant deviations from normal electrocardiographic findings (76). Wilens (88) showed in an autopsy study of obese patients a significantly higher percentage of atherosclerosis. Joslin (47) found that 85 per cent of the diabetics he studied over the age of 40 were to some degree overweight (23). Many investigators (42, 53) have found that there is a higher incidence of cancer among the obese. Recently, secondary polycythemia (86) associated with obesity has been demonstrated; apparently obesity produces a high diaphragm and emphysema which results in poor pulmonary ventilation, depression of oxygen saturation, and a compensatory secondary polycythemia. It is well known that obese patients offer a great hazard operatively because of the difficulties inherent in exposure of the operative site and subsequent wound closure and healing. Obese patients are also more prone to sustain traumatic accidents such as fractures.

The exact nature of the relationship between certain disease states and obesity has not yet been clearly defined. For example, coronary heart disease is known to be especially common in obese persons. It is not known whether the excess weight of the obese patient causes overwork of an already compromised atherosclerotic heart, helping to precipitate a coronary occlusion, or whether a high dietary fat content, characteristic of the diet of most obese patients, accelerates the production of atherosclerosis which in turn contributes to coronary heart disease. Probably both factors are important.

A conclusive way of demonstrating the end result of any disease is to show its effect on the mortality as well as the morbidity rates. Newburgh (54) demonstrated that there is a 1 per cent increase in the mortality rate of obese men for every pound they are overweight in the 45 to 55 age group; for example, an individual in this age group who is 50 pounds overweight has a 50 per cent greater chance of dying during the next year than a man of normal weight. The insurance companies estimate that obese persons have a higher than normal death rate in every age group; Dublin and Marks (24) have estimated that the death rate in obese patients is 1½ times that of persons who are of normal weight. Also when specific diseases are associated with obesity, death rates are even higher; e.g., with cirrhosis of the liver, the death rate is 149 per cent above average; with diabetes 133 per cent; and with chronic nephritis it is 91 per cent above average (34). Armstrong and his associates (4) have demonstrated that when weight reduction has taken place in persons with associated organic

diseases, 50 per cent showed no progression of the disease and continued to feel better both clinically and symptomatically after 5 years at their reduced weights. It is also well known that the incidence of coronary heart disease is low where undernutrition exists, and that diabetes is less common in the lean than in the fat. The aforementioned findings thus emphasize the urgent importance for good weight control.

Cause of Obesity

Obesity is always alimentary in origin. According to Newburgh (54) obesity is due to "an overall intake of energy which has exceeded the total dissipation of energy in the body i.e. a positive energy balance." Richardson (66) has described the mechanisms involved: "The human body is a closed energy system which can store calories in the form of foodstuffs as well as in the form of heat. The energy of food can be added to the system only by means of the ingestion of food calories, and energy can be removed only by dissipating calories into the environment or by the performance of mechanical work. Therefore if fat is to be removed from the body, fewer calories must be put in or taken out, or more calories must be taken out than are put in." The number of calories involved may be small, but their total cumulative effect is great as far as weight gain is concerned. Van Noorden (85) has noted that the ingestion of 200 calories per day above the body's energy needs will result in a weight gain of 17 pounds in 12 months. Strang (82), faced with the often repeated statement of obese patients that they really did not eat enough food to maintain their obese weight, took a series of such patients, noted from them their acknowledged dietary caloric intake, and in a controlled environment actually fed them what they claimed they ate; invariably every patient lost weight!

Bodily regulatory mechanisms controlling food intake. In the normal person, food intake is well balanced with energy output as a result of the control of various bodily homeostatic regulatory mechanisms. The urge to eat is a complex phenomenon which has physiological as well as psychological components. A distinction is sometimes drawn between hunger and appetite; hunger may be thought of as a desire to eat based largely on physiological reactions to food depletion, while appetite is a desire to eat based primarily on psychological or learned factors.

Grossman (36) defines *hunger* as the complex of sensations evolved by the depletion of body nutrient stores. Quigley (57) notes that hunger is produced by special movements of the stomach called hunger contractions. The contractions produce periodic epigastric pains associated with nervous excitability, restlessness, headache, and fatigue and are always associated with the inadequate intake of food; they induce the individual to ingest food, and the ingestion relieves the pains. It is known today, however, that hunger sensations from the empty stomach are not an absolutely requisite condition for the existence of the desire to ingest food or for the arousal of the hunger drive because there are additional physiological and neural mechanisms which also contribute to the control of food intake. As proof that stomach hunger contractions are not essential for the production of a desire to ingest food, Quigley notes that food intake is not decreased by cutting both vagi, the splanchnics, by vagotomy with splanchnectomy and celiac ganglionectomy, or by total or partial gastrectomy. It is also known that decorticated dogs and anencephalic infants while not seeking food will swallow when food is placed in their mouths.

Appetite, on the other hand, has been described as a desire for food, a pleasant affective state which is specifically founded on the learning or memory of the disappearance of hunger sensations associated with a comfortably filled stomach; that is, appetite is learned through the reduction of the hunger drive, and is closely related to the agreeable taste, smell, and appearance of food. Appetite is a major *psychic* force in regulating the intake of food in man. Quigley notes that the quantity of food ingested at one time can be influenced by both hunger and appetite; for example, a hungry person may eat to full satisfaction when food is available, but appetite may induce the person to overeat once he has reached a point of satiety. In obesity, most authors agree that there is a marked disturbance not in hunger but in appetite.

The neurophysiological basis for hunger and appetite has not yet been completely elucidated. Grossman points out that the act of feeding is a motor act of skeletal muscles, such as the muscles of the head, neck, and of mastication, which are governed by nervous processes similar to other voluntary muscles. Brobeck (8) notes that in its simplest reflex form, as in the infant, the feeding reflex is stimulated by the sensory end organs such as those of olfaction, taste and vision which have central connections through the brain stem with the skeletal muscles of feeding. In higher animals and in man, the hypothalamus as well as the cerebral cortex have an increasing degree of facilitating or inhibiting effect on these basic feeding reflexes, and are therefore the main neural centers controlling hunger, appetite and the desire for food. The lateral area of the hypothalamus facilitates feeding reflexes while the medial area inhibits such reflexes. The hypothalamic eating center is in turn profoundly affected by various bodily regulatory mechanisms acting upon it. For example, hypothalamic functioning is influenced by impulses from the cortex, particularly emanating from the frontal lobes,[4] as well as by stomach distention (through connections via the vagus and medulla with the stomach), and by changes in blood glucose levels. The following chart I is based, with some modification, on the work of Brobeck who has listed some of the mechanisms exerting their influence on the hypothalamic feeding centers.

		Cortex ⇵		
Facilitating Mechanisms	→	*Hypothalamus*	←	*Inhibiting Mechanisms*
Contractions of empty stomach.		↓		Distention of stomach.
Cold environment.				Warm environment.
Lowered supply of blood glucose.		Eating:	→	Increased blood glucose.
Barbiturates.				Amphetamines.
				Dehydration.
				Excercise.

CHART I. *Bodily Mechanisms Influencing the Hypothalamic Feeding Center*

Watts (87) has suggested the existence of a cortical representation of the intestinal tract and believes that cortical disturbance acting through the hypothalamus is responsible for the morbid hunger which is often associated with cerebral cortex disease.

In most cases of obesity, there seems to be a disturbance of the learned desire for food, that is of appetite and *not* of hunger. It is believed that most of the body regulatory mechanisms tend to maintain the body at a normal weight in obese as well as in normal people. However, the influence of psychological factors through cortical connections with the hypothalamus very likely upsets the normal body regulatory control mechanisms. *It has been postulated that psychic cortical factors in addition to or in spite of certain of the automatic somatic regulatory mechanisms produce a disturbance in the activity of the hypothalamic eating center; this causes an abnormal appetite which may result in an abnormal increase of food intake.* Although the desire to eat (hunger) is normally aroused by the action of homeostatic mechanisms upon the hypothalamic feeding centers, it is structurally and functionally possible for the desire to eat (appetite) to become aroused by cortically mediated stimuli such as thoughts, feelings and perceptions acting on this same feeding center. It has been hypothesized that this "conditioned hunger" or appetite mechanism is responsible for the overeating and subsequent obesity of those patients who suffer from abnormal appetites.

Types of obesity. There are two types of obesity according to classic definition: namely exogenous, simple, or common; and endogenous, metabolic, or endocrine obesity. Most authors are critical of this distinction because they believe that separating exogenous from endogenous implies that the latter may not be due to excessive intake of food but is due to an abnormal metabolic utilization of food causing persons with normal caloric intake to

[4] There are also indirect neural connections with the prefrontal areas through the *medial thalamic nuclei.* The hypothalamus also has connections with the *gyrus cinguli* of the cortex via the anterior thalamic nuclei. Neural connections with the visceral brain and the important rhinencephalic structures, via the fornix and stria terminalis, also play a significant role in the regulation of the hypothalamus.

gain weight because of metabolic abnormalities. This is never the case, for both exogenous and endogenous obesities always are due to hyperalimentation. Most of those who adhere to an endogenous etiology for some cases of obesity now admit that even these cases require an excessive intake of food to produce an excessive accumulation of adipose tissue. The authors agree with Rynearson (71, 72) who notes that the concepts of exogenous and endogenous are confusing and should preferably not be used.

A. *Exogenous, simple, or common obesity.* Most investigators agree that 95 to 97 per cent of all cases of obesity fall into this category (70). There is no question of any metabolic disorder in exogenous obesity which is a reversible condition clearly due to an excessive food intake as compared with energy output.

B. *Endogenous, metabolic, or endocrine obesity.* Silver and Bauer (78) estimate that about 3 per cent of the total cases of obesity fall into this heterogeneous group. Newburgh (54) notes that obesity is never directly produced by an increase or decrease in the activity of an endocrine gland. Metabolic obesity when it exists is the result of hyperalimentation caused by a disturbance of appetite which has its origin in so-called endogenous sources. Rony (69) in his comprehensive treatise on obesity concluded that there is "no consistent evidence of any specific disturbance in the intermediary metabolism of fat that could be regarded as a major cause of obesity." Many theories have been proposed to explain the accumulation of weight in the obese patient on the basis of metabolic abnormality. Newburgh notes that invariably the metabolic hypotheses have not been able to withstand clinical verification.

Somatic Factors in Obesity

Many attempts have been made to account for obesity in terms of somatic factors. Among the possible physical causes that have been investigated are metabolic factors, endocrine disturbances, neurological lesions, neuroendocrine factors, and hereditary factors. The following is a summary of the present status of the somatic factors that have been suggested as causing obesity:

1. *Metabolic factors.* The relationship between various metabolic factors and obesity has been investigated and so far no significant relationship has been demonstrated.

a. *Luxus Konsumption* (33): It was postulated that in normal persons an increase in food intake is followed by a corresponding increase in basal metabolic rate which thereby maintains a constant body weight; this reactive changeability of the BMR was called Luxus Konsumption. In obese patients it was suggested that the BMR does not increase as it does in normals which therefore results in excessive weight gain. However, this hypothesis was disproven through careful metabolic studies (54).

b. In the past, various investigators have felt that obese patients conserve more energy than normal people. It has been demonstrated, however, that in reality obese patients expend *more* energy to perform a given piece of work than do normal persons (54).

c. At times it has been claimed that obese people have a greater absorption, assimilation, or a more efficient digestion of food than do normals. Others have claimed that there is a disorder in the enzyme system which controls the oxidation of carbohydrate. None of these concepts has withstood experimental investigation.

d. Von Bergmann (54) and later Hetenyi (43) suggested that obese patients have a *lipophilia* which is a hereditary constitutional tendency of their adipose cells to excessively accumulate fat. However, careful studies indicate that obese persons release fat from their stores as a source of energy as readily as normals do. In fact, since fat people have a below normal respiratory quotient, it may be concluded that they oxidize more fat than normal people. In addition, they produce more heat in the basal state and have a greater total heat production than most. There is no reduction of output of calories as shown in the basal metabolism; in fact most obese patients have a normal or increased basal metabolic rate (22). There is no evidence for a negative phase of metabolism. The specific dynamic action of food is not diminished (69), and no difference in muscular efficiency (85) has been demonstrated.

Results of the investigation of the metabolic factors of endogenous obesity indicate that obese people expend a greater amount of

energy than normal, and absorb no more energy than do normal persons from their food. Therefore, it may be concluded that they eat more than normals and must continue to do so consistently to *avoid losing* weight!

2. *Endocrine disturbances.* There is very little evidence to support the thesis that glandular abnormality plays a significant role in any large number of cases of obesity. Among the clinical syndromes and various glandular malfunctions that have been suggested as being etiologically related to obesity, the following seem important to mention:

a. *Disease of the pituitary gland:* Even though hypopituitarism is thought to occasionally result in the serious anorexia and leanness of Simmonds' disease, there is no consistent evidence that obesity can result *per se* from *hyper*functioning of the hypophysis.

b. *Disease of the thyroid gland:* In the past it has been a popular concept among laymen as well as physicians that obesity was frequently associated with hypothyroidism. Today, most workers feel that the incidence of thyroid obesity is rare. Plummer (58) has demonstrated that hypothyroids may be lean or fat. In fact, he found that in myxedema there was *no* tendency towards obesity, and when it did occur, it could be correlated with excessive food intake and not with any metabolic abnormality. Williams (89) found normal blood iodine levels, which are a good measure of thyroid activity, in a group of very fat men and women. It has also been thought that obesity was associated with the low basal metabolic rate of hypothyroidism; however, Boothby (7) found that most obese patients have a normal or increased BMR. Bruch (11, c) found an increased BMR in a series of obese children. In fact even when the BMR is very low, it is felt that this does not cause obesity. It must be concluded therefore that disease of the thyroid does not play a significant role in the causation of obesity.

c. *Disease of the adrenal cortex:* Hyperfunctioning of the adrenal cortex, as for example resulting from a tumor, may result in Cushing's syndrome. In this disease, there is a type of adiposity described as buffalo adiposity where fat is concentrated in the upper parts of the body and trunk; this is usually but not invariably accompanied by an increase of body weight. The localized "buffalo" distribution of adipose tissue is probably hormonally determined. A mechanism that has been proposed to explain the etiology of this syndrome is that excessive adrenal steroid secreted by the adrenal cortex increases appetite and thereby enhances food intake leading to buffalo adiposity. Dorfman has suggested that when the ordinary obese patient is under stress, for example, as a result of emotional conflict, adrenocorticotrophic pituitary hormone may stimulate an excessive secretion of adrenal cortical hormone which increases the appetite and results in increased food intake. This physiological mechanism would offer a reinforcement of the psychological factors which are the chief causes of the overeating.

Cleghorn (16) notes Margolin's suggestion that one aspect of *severe* obesity may be considered to be a type of *addiction* associated with adrenal corticosteroids. Margolin feels that extreme cases of obesity almost resemble malignant processes, and that there must be a physiological reinforcement of the important emotional drives involved in the genesis of the condition. For example, he has noted that in obese patients, with the loss of a certain amount of weight through dieting, a threshold is often reached at which level there is a reactivation of their compulsive eating. Margolin accounts for this phenomenon by suggesting that the excessive deposits of adipose tissue had previously absorbed and stored excessive steroid hormones and that, as a result, the glands producing these underwent adaptive hypertrophy. (Support for this latter postulation is found in the observation of Robinson and Norton (68) that certain obese individuals without apparent pituitary dysfunction have a high excretion of corticosteroids resembling that of patients with Cushing's disease.) In such cases, Margolin suggests that weight loss renders excessive hormone secretions available not only from the hyperactive glands but also from the fat deposits. He suggests that this excessive blood corticoid level produces a somatic reinforcement of the compulsive psychic drive to overeat. Hence, Margolin concludes that fat people who overeat for psychological reasons cannot lose weight beyond a certain amount because of the increase in the force of the somatic factor; this

metabolic enhancement of the hunger drive reinforces the psychic drive. It is important to note that while Margolin's hypothesis is stimulating and provocative, it has not been clinically or experimentally validated by bio-assay methods that the critical level of steroid excretion consistently increases at a certain point in the psychotherapy or medical management of obese patients when after the loss of a certain amount of weight they find it hard to maintain their diet.

d. *Disease of the pancreas:* Insulin is known to produce an increased intake of food (28, 37) by lowering blood glucose. In an individual afflicted with excessive insulin secretion, there is a danger of hypoglycemic coma particularly in the morning; accordingly these persons have a characteristic morning hyperexia at which time they usually ingest carbohydrate in order to maintain their blood sugar levels. As a consequence of this situation, in which there is excessive ingestion of food, obesity frequently results.

On the basis of the aforementioned findings, Portis (59) has postulated that there is a functional hyperinsulinism in individuals subject to acute or chronic stress. This excessive insulin secretion would result in a functional hypoglycemia which would necessitate the ingestion of increased amounts of food, particularly carbohydrate, and thereby could possibly lead to obesity. Mayer (51) has propounded a glucostatic theory in which hypothalamic glucoreceptors which are sensitive to fluctuations in blood sugar level increase food intake in order to counteract hypoglycemia; these glucoreceptors might mediate the increased food intake associated with the functional hyperinsulinism of Portis. Newburgh (54) disagrees with the suggestion of hypoglycemia as a cause of a significant number of cases of obesity by noting that obese patients exposed to blood sugar level determinations cannot be demonstrated to be hypoglycemic; most often, in fact, they are *hyperglycemic.*

e. *Disease of the gonads:* It has been noted that hypogonadal males frequently have fat pads in the hips and breasts associated with moderate to severe obesity. Obesity is also supposed to frequently occur with eunuchoidism, and it has been suggested that this might be related to the common occurrence of obesity in lower animals following castration. However, there is no evidence that obesity when it occurs in humans is due to hypogonadism or that obesity can be helped by the injection of sex hormones. Perhaps the gonadal malfunction produces a psychological disturbance which in turn may modify the appetite. For example, the overeating and weight gain so often associated with the menses have now been shown to often be related to the psychological pre-menstrual tension that develops in many women; this tension results in compulsive overeating. Thus the resulting hyperphagia is psychologically determined and not hormonal in origin as was previously suggested.

3. *Neurological Lesions.* Neural mechanisms as noted in the section on hunger and appetite are extremely important in the regulation of body weight. Lesions of the central nervous system affecting the integrative nervous centers might well disturb food intake and be a major cause of obesity (44, 60, 61). The basic integrating center for facilitating and inhibiting appetite in man and lower animals has been demonstrated to be located in the hypothalamus. Ranson and his associates (61) have conclusively demonstrated that by destroying the medial nuclei of the hypothalamus in rats, there develops an inability to stop eating. The rat's appetite becomes voracious and savage, and his food consumption increases tremendously which uniformly leads to obesity. By destroying the lateral hypothalamic nuclei, anorexia results. Tepperman (84) found that rats with hypothalamic lesions eat all their food at one time and thereby get fatter than when their food consumption is spaced out for several meals during the day even though the total food intake in both cases might be the same. He concluded that they had an increased capacity to convert glucose to fat by eating all their food at one time. Some authors (85) have noted that obese patients very often eat most of their food at one meal—the evening meal—and have questioned whether this pattern of food ingestion does not make for an increased conversion of glucose to fat in obese humans. Many clinicians in view of this clearly definitive work in lower animals have hypothesized that this neural hypothalamic mechanism is disturbed at least in some cases of obesity. They believe that the increased

appetite in obesity seen in association with chronic encephalitis, pituitary lesions, third ventricle tumors, frontal lobe tumors, patients who are status post-lobotomy or have brain injuries and pineal gland tumors is due to involvement of the hypothalamus. On the other hand, Gray (35) feels that invariably in patients afflicted with these conditions there is prolonged inactivity, and that the obesity and increased appetite observed in these disease processes are the result of inactivity; he believes it is similar in origin to the obesity following other chronic invaliding illnesses such as fractures.

Burdon (14) has suggested that the marked hunger noted in some idiots and mental defectives may be associated with irritation or destruction of the "cortical nerves innervating the intestines." He apparently includes in this grouping the obesity associated with the heredofamilial Laurence-Moon-Biedl syndrome which is characterized in addition by mental deficiency, polydactyly, retinitis pigmentosa and hypogenitalism, as well as the Morgagni-Stewart-Morel syndrome. Most authors have suggested that these cases are primarily associated with hypothalamic involvement which abnormally increases the appetite. In these patients, no endocrine disturbance has been demonstrated. While the actual cause of these diseases is not known, it appears that the symptom of obesity is due to excessive food intake.

Bruch (11, d) has suggested another role for the hypothalamus. She believes that fat storage is *not* "an entirely passive process dependent on supply and demand and that adiposity following lesions of the midbrain may be considered a sequel of *altered tone* of adipose tissue due to hypothalamic stimulation of the autonomic nervous system." There has been no verification of this thesis.

Thus we see that in man, up to the present time, no organic lesions of the neural appetite regulatory centers in the hypothalamus have been demonstrated in simple obesity although the existence of such pathology has been postulated.

4. *Neuroendocrine factors.* Cleghorn (16), recognizing the confusion that exists nosologically in defining endogenous causes of obesity, attempts to clarify what is known about some of the endocrine disturbances and obesity in a discussion which he bases largely upon the thinking of Stevenson (83). Cleghorn feels that many cases of endocrine obesity may be included under the heading of *adiposogenital dystrophy*; another name for this condition is Frohlich's syndrome. This disease is characterized by obesity, sexual infantilism and skeletal abnormalities. It may be associated with tumors of the pituitary, tumors or infections of the hypothalamic areas, or no gross pathology at all. Adiposogenital dystrophy encompasses a broad spectrum of pathology including patients with abnormal sexual and skeletal structures persisting into adult years, cases showing normal but late sexual maturation in association with persistent bone deviations, and even those maturing sexually and assuming a normal configuration with adolescence. In all these patients, however, skeletal defects do not disappear with dieting. Cleghorn believes that genetic factors are important in the occurrence of obesity in this disease. Cleghorn's attempt to clarify this type of obesity does not offer an explanation of the mechanisms which cause the overeating that lead to the excessive weight observed in these patients.

5. *The hereditary factors.* Various workers have postulated that obesity is hereditary in origin. Some have suggested that there is an "inborn error of metabolism" whereby an individual becomes obese even when food intake is normal because the hereditarily determined metabolic deficiency causes an abnormal accumulation of excessive adipose tissue. Gurney (38) found that one or both parents of 82 per cent of the obese patients he studied were overweight, which he interpreted as suggesting the existence of a hereditary metabolic factor in these patients.

Other investigators feel that there is an inheritance of a *hereditary bulimia.* This is similar to the hyperphagia found in the obese yellow rats studied by Danforth (19) where overeating was a dominant genetic trait. Gastineau (29, 30) and Schick (73) believe that there is a genetically determined constitutional tendency toward obesity in certain obese patients as a result of hereditary influences upon the appetite-controlling center in the hypothalamus. Schopbach and Angel (74) have

expanded this latter view fully in their hereditary concept of human obesity; they believe that obesity occurs in the presence of genes which not only sensitize the hypothalamic appetite mechanism, but which also accelerate total body growth, and tend to stop both physical and emotional growth earlier than usual through their effect on the adrenarche and menarche. These authors feel that external stressful factors initially precipitate the hereditarily based bulimia which is the immediate cause of the obesity.

Newman (55) quoted by Dorfman (21) notes that identical twins reared together show similar body weights, but when reared apart show a wide variation which seems to be directly determined by the differences in their environment. The previously mentioned fact that about 80 per cent of obese patients have a family history of obesity may be attributed at least in part to the influence of a common environment, identification with fat parents, and utilization of learned oral methods for coping with anxiety rather than being due to a genetic factor.

In conclusion, the present authors' view about the role of heredity in obesity would approximate Newburgh's concept that "body build is inherited, obesity is not!" (54). A certain genetic constitutional predisposition to obesity *does* seem to exist whereby overweight tends to occur in certain familial and racial groups. The stocky builds of the Dutch and Italians, the lean builds of the Prussians and Norwegians, the muscular and big-boned son of the muscular and big-boned father, and even the characteristic leanness of the Greyhound dog, all seem to be due to some genetic predisposition toward a definite type of *body build* and *fat* distribution. However, the environmental and family eating habits may influence an Italian to undereat and be thin, or a Prussian to overeat and be fat, or a Greyhound to be overfed and become obese. Thus the relative influence of environment as compared to heredity is variable in each obese patient, but the inevitable predominant importance of environment and other exogenous factors in the majority of cases of obesity seems to be unquestionable.

Summary of somatic factors. In at least 97 per cent of the cases of obesity, the excessive accumulation of adipose tissue is clearly due to overeating; these "exogenous" cases result from an excessive caloric intake over energy output. There is general agreement that there is no endocrine or metabolic abnormality in most obese persons. Disturbance of appetite appears to be the crucial factor in most cases of overweight; this causes obese persons to eat an excessive amount of food over and above their normal bodily need and energy expenditure. Appetite, while being under the control of various bodily regulatory mechanisms (gastric, neural, etc.), is a learned phenomenon largely under the influence of psychic and emotional factors. It seems likely that cortical impulses impinging on the hypothalamus play an important role in determining the degree of appetite and alimentation, for the major neural integrating center for facilitation and inhibition of feeding behavior is located in the hypothalamus. Some authors feel that there is a hereditary predisposition to obesity in many cases through a genetically determined hypothalamic hyperphagia. Also there may be an increased metabolic conversion of glucose to fat because of the tendency of obese people to concentrate their food ingestion at one meal. Most investigators agree that somatic factors, while playing some role in overeating, cannot fully account for the compulsive hyperalimentation seen in obesity, and that emotional factors are crucial in the development of the condition.

Psychological Factors in Obesity

During the last two decades, as a result of the work of various investigators in the field of psychosomatic medicine such as Alexander, Coriat and Bruch, there has developed an increasing awareness of the psychological factors in obesity. As somatic studies ruled out the many metabolic postulates that had been proposed to explain obesity, it became apparent that the relationship between psychological factors and excessive food intake had to be clarified in order to understand the total problem of overweight. In the search for the psychological origins of overweight, there has been a tendency for investigators to examine *specific* factors in the culture, environment, family history, personality structure and the unconscious of the obese patient. The uncritical

application of concepts derived from sociological and psychological levels of description to the problem of obesity has some times resulted in confusion. The following are a summary and evaluation of some of the more important of the psychological factors that have been suggested in the literature.

The psychology of hunger and eating

The phenomena of hunger and eating have been extensively studied in the psychological laboratory, and their functional properties have been described in some detail. Hunger is a complex reaction which has unlearned and learned physiological as well as psychological components. On a psychological level description, hunger is a "learned drive"; that is, the desire for food is highly conditionable and can come to be elicited by any number of visual, auditory, olfactory, and cognitive stimuli. It is common experience that one's appetite can become aroused by *seeing* a chicken being roasted in a shop window, by *hearing* a steak sizzle, by *smelling* a pie in the oven, by the arrival of one's customary dinner hour or by thinking or reading about food. The repeated temporal association of the aforementioned stimuli results in their evoking a conditioned hunger reaction. This conditioning process has its anatomical basis in the various neural connections of the hypothalamic feeding center. Since cognitive and affective cues as well as sensory stimuli can affect the feeding center, it is possible that hunger may come to be evoked by such distressing factors as fear, loneliness and feelings of unworthiness if such distressing situations have in the past been associated with hunger. For example, if an infant were habitually frightened and neglected by his mother who did not heed his hunger cries promptly, then the fright and anxiety associated with being abandoned might become associated with rising hunger pangs, and in later life such an individual might be expected to "feel hungry" when faced with a frightening situation. A similar situation might develop as a result of a poor child's association of hunger and the rising tensions in his family when his father was out of work. Such a *conditioned hunger response* might account for the overeating and subsequent obesity of patients who experience *abnormal appetite* not based on nutritive needs.

Hunger also has drive properties which impel an individual to action and, if permitted to mount, can act as a very powerful drive or motivation. Any response which is followed by the reduction of a drive is said to be reinforced and learned, and reduction of hunger thereby mediates the learning of new responses. This principle is used in training animals by giving them bits of food as a "reward" for performing some task. The response of eating normally reduces the hunger drive, and one of the earliest things an individual learns is to eat when hungry. The process of learning through drive reduction just described can take place without the individual's conscious awareness.

It has also long been intuitively realized that feeding may be used to combat fear responses. Thus Jones (46) was able to extinguish a child's fear of a rabbit by introducing the rabbit while the child was eating his lunch. Recently the relationship between eating and fear or anxiety has been more systematically investigated. It has been demonstrated that emotional tensions such as fear or anxiety, like hunger or thirst, also constitute drive states which motivate the individual to act. Thus any response which is followed by reduction of fear or anxiety is reinforced and learned. In some as yet imperfectly understood manner, anxiety may be directly reduced in a number of ways such as by the excessive ingestion of alcohol, masturbation, compulsive behavior, and interpersonal contact *as well as by eating*! It follows that *anxiety can motivate a person to eat* once he had learned to diminish anxiety with food.

The mechanism by which eating reduces anxiety is as yet poorly understood. There are probably important learned factors involving conditioning, for example, through the association of pleasurable non-anxious situations with feeding. However, the anxiety reducing effects of eating can hardly be accounted for solely on the basis of learned habits. It may be speculated that there is some degree of physiological incompatibility between the act of eating and intense fear or anxiety; it has been demonstrated that while eating, intense anxiety states are temporarily diminished. The *anxiety reducing effects* of eating could account

for the ***compulsive overeating*** and consequent obesity of those patients who feel an irresistible urge to eat ***without experiencing unusual hunger or appetite.*** Such patients eat to reduce the anxiety drive; their appetite need not necessarily be disturbed.

Culture and environment

Both because of the emphasis of the medical profession upon the adverse physical effects of obesity, and the cosmetic premium placed upon thinness in *our* society, the obese person is usually subjected to great pressure to lose weight; for many obese patients, obesity results in feelings of inferiority and self-depreciation. However, in spite of the current social disapproval of obesity, there are still certain situations where obesity is not only taken for granted but is at times considered desirable. The Pennsylvania Dutch are well known to make a feast of every meal; Italians and Jewish families are exceptionally proud of their "good tables". Obesity is the price they pay. To many families, a fat child is a healthy one and a thin child indicates poor upbringing and sickness. In Europe, the Victorian standard of a moderately obese woman, particularly around the breasts and shoulders, still persists; obesity in a person from such a culture must be interpreted accordingly, and moderate overweight does not necessarily mean that the person will be isolated and rejected by other people. Certain occupations involve the constant exposure to food, and at times this may play a contributory role in obesity; e.g., in cooks, restaurant workers, brewery employees, confectioners, and even in the business man who does much of his business over the dinner table and thereby is exposed to the suggestive effect of attractive menus and food. There is the ex-college athlete, previously used to big meals while he was a young college letter man exercising every day, who as an adult becomes tied down to the sedentary life of the business executive; if he continues to eat excessive food as if he were still twenty-one years old, he will probably become obese. Freed (26) notes that persons originating from impoverished homes, where they were often insecure about the supply of food, may develop an aggressively acquisitive attitude about food, and when it is available may gorge themselves particularly on high caloric carbohydrate foods. Other authors, such as Grinker, have suggested that various current trends in the American socio-economic scene are etiologically significant in obesity. Among the sociological factors which are helping to make us a nation of overweight are: the present day increased emphasis upon mental activity and education and the depreciation of muscular activity and physical labor; decreased working hours providing more leisure time which is often used for overeating; a higher living standard, with more money for the purchase of appetizing and interesting foods; and the trend toward spectatorship rather than participation in sports. It would seem then that since man's eating control mechanism is susceptible to external influence, the culture and environment often contain elements that may contribute to the development of obesity!

Precipitating factors

Although obesity usually dates back to early childhood, it may frequently have an acute onset at a later age. It has often been noted that obesity may develop rapidly after the occurrence of a sudden trauma or stress (77). Gilbert-Dreyfus (31), in a discussion of paradoxical obesity (that is, obesity with sudden onset), found that the most common precipitants in the group of Europeans he studied were bombings, the harrowing experience of prisoners-of-war and being in a concentration camp. Conrad (17) notes that illness, surgical operations, attendance at a new school, and marriage and childbirth may precipitate acute obesity. Burdon (14) feels that problems centering about puberty, sibling rivalry, hospital experience, prolonged bed rest, fear of an amorous suitor, menopause, and situations involving social or intellectual failure also may be determinants in acute obesity. According to Hochman (45) financial reverses and death of a parent are important factors. Richardson (67) found that *acute post-partum obesity* commonly occurs in women who weighed a great deal at birth, were overweight at the time of marriage, and had mothers who were obese; the probability of obesity occurring is so great in such women that Richardson makes it a

practice to manage them carefully during pregnancy in order to avoid post-partum overweight.

It is the authors' impression that the various acute stresses precipitating obesity described in the literature seem to be non-specific and similar to the various acute psychic traumata that may precipitate any neurosis or psychosis. The experiences mentioned that seem to cause obesity all seem to be acutely anxiety-provoking to the individual involved and as such may herald the onset of any neurosis, psychosis, or psychosomatic disorder. The source of the precipitating trauma appears to have no consistent bearing on the choice of symptoms of overeating and overweight.

Psychodynamic considerations

The problem of the specific psychodynamic factors that lead to emotional conflict and obesity has been discussed by many authors; the selection of the eating mechanism is clearly an attempt to cope with these conflictural factors. Freud (27) Abraham (1) and Alexander (3) have presented the most comprehensive formulations. Schick (73) has summarized the Freudian views as follows:

> (in obesity) . . . the underlying psychopathology . . . (is) the unconscious desire to experience again the satisfaction derived as an infant in the intake of food. . . . The infant's life revolves around nourishment. In infancy, the ingestion of food is the most important function of self-preservation and the highest available pleasure. Freud points out that original sexual excitement depended upon this need for nourishment. The sexual activity in that phase is not yet separated from the intake of food. . . . Rado holds that in infancy the entire process of digestion is charged with libido, a condition he calls alimentary orgasm. In the normal adult, vestiges of the alimentary orgasm remain. The faulty habit of eating may be in some instances . . . a manifestation of and a regression to an oral level.

Most authors adhering to this line of thinking would explain that obese patients, frustrated in their adult functioning, regress to the oral level and overeat in order to fill the void in their adult life. They are conceived of as people who are *fixated* to the oral stage. Regression recalls the pleasurable *nirvana* at the breast and allows the obese patient to avoid facing adult life's frustrations and offers them a substitute through an infantile form of gratification; adult obesity thus is a direct reflection of infantile orality. Another common Freudian psychoanalytic interpretation might translate eating into terms of frustrated dependency which is represented in a "wish to be loved." When this wish to be loved is denied by external reality, the patient regressively seeks gratification through a wish to be fed resulting in overeating and obesity. Most of the workers who have sought to explain obesity on the basis of specific psychodynamic factors have been influenced by the Freudian formulation of this problem. The resulting contradictions and conceptual confusion may be attributed, at least in part, to the uncritical use of concepts, which while useful on the psychoanalytic level of personality description, are inappropriately utilized to explain overeating and obesity.

Specific factors in the obese patients' family history and personality structure as well as the possible meanings of food and overweight have been suggested as causing obesity:

a. *Family history:* Many investigators have examined the family structure of obese patients and have concluded that specific parental character traits and family situations have played significant roles in the genesis of their obesity. Most of these workers (11, 29, 30, 75) describe the *obesigenic* homes as being dominated by a powerful mother figure with the father usually being weak, submissive, unable to give positive guidance to the obese child, "a man with little ambition and drive who holds little status in the family circle." Shrovon and Richardson (77) describe the maternal figure as being controlling, overprotective, overindulgent and cold. Bruch (11) who has much experience in working with mothers of obese children has attempted to describe them in detail. She feels that such mothers characteristically display an apparent oversolicitude for their children in order to cover up their hidden rejection and resentment. She found that these mothers were domineering; they tended to treat their progeny as prized possessions upon whom they lavished excessive material things, such as food, in order to compensate for the emotional deprivation sustained by the children; food becomes for the obese child a "substitute for the love" that the mother was unable to give. Bruch found that these mothers are

highly ambivalent toward their children and alternate their overprotectiveness and overfeeding with outbursts of cruelty and hostility. They are possessive and want their children completely. They do not encourage their children's independence and initiative, and for this reason, they prefer daughters to sons because daughters tend to stay dependent for longer periods of time and more often do not leave their mothers when they marry; such mothers tend to feminize male children. Bruch found that the mothers of obese children characteristically suffered poverty during childhood, a type of physical as well as emotional starvation that causes them to feel deprived and to pity themselves even as adults. These mothers tend to be lonely people with few friends and no community or recreational outlets. "In a primitive way they try to create for their obese children that normal carefree childhood of which they feel they had been deprived and which is represented for them in a llfe of idleness and an abundance of food" (11, a).

A group of investigators at the Mayo Clinic recently demonstrated the importance of the parental role in the development of childhood obesity (25). They showed in certain cases of obesity that the parent's unconscious wish for obesity in their children was a major factor in the child's development of overweight. In fact these investigators demonstrated that when as a result of psychotherapy the parents gained insight into the effect of their actions upon their children, actions which were motivated by the parents' unconscious wishes, the need for the symptom of obesity in the children was abolished and weight reduction followed.

It is frequently stated that the early home life of obese patients was characteristically unhappy and that their parents' marriage was a poor one with open demonstrations of aggression and antagonism. Bruch found that their families were characteristically small with the obese patient being the only child or youngest in 70 per cent of the cases studied; about half the obese patients were unwanted children. Bruch felt that this type of aforementioned hostile environment interferes with the development of an adequate sense of security, competence and worthwhileness. She found that almost uniformly the families were proud of their table, and an unusually large percentage of the family income was spent on food; characteristically little concern was shown about their child's obesity. These observations have been interpreted by Bruch to mean that inasmuch as these families are usually lacking in love and warmth, food becomes the chief "substitute for love" and it gains inordinate importance (11, 12, 13). (The attempt to clarify the mechanism of such a "substitution" is confusing and is an example of the conceptual difficulties which result from the uncritical merging of generalizations from different levels of psychological and physiological description.)

The discussions in the literature of the disturbed family backgrounds of obese patients are vivid in their description of unhappiness and psychopathology, and various of the aforementioned authors have implied that the backgrounds of obese patients show a *specific* type of family constellation and disturbances. This specificity hypothesis has never been validated experimentally. In their clinical experience with obese patients, the present authors have found no such uniform *obesigenic* family type. In fact they have not found a specific family constellation in *any* neurosis, psychosis or psychosomatic disorder. While the authors feel that patients suffering from obesity do characteristically show a history of disturbed family origins and relationships, the nature of those disturbances seems to be liable to any type of variation and does not appear to be specific. The specific family history that has been proposed to account for obesity is similar to that proposed for many other psychosomatic and psychopathological conditions. For example, there is a close resemblance between the dominating "oral sadistic mother" described in obesity and the maternal figure described in peptic ulcer. In both cases the mothers may be orally rejecting, and both may use food for control. It may be speculated that the mother-child relationship is consistently disturbed in cases of obesity as well as in peptic ulcer. The importance of this disturbed relationship has been discussed fully by Sperling (80) in relation to a variety of psychosomatic disorders. The authors have observed in many cases of obesity that a

great emphasis was placed upon food and its psychological meaning, availability and use for purposes other than nutrition by the obese patients' parents, and this situation would seem to be significant in the etiology of the condition when it exists.

The present authors believe that the family history seems to influence the development of obesity in two respects. First, an individual's home environment determines to a great extent the quality of his psychological adjustment, and it has been found that obesity tends to occur in persons who are maladjusted or emotionally disturbed. Also, family habits and attitudes toward food may predispose a psychologically unstable individual to choose overeating as a psychological defense. It may be speculated that obesity is likely to occur in persons who come from backgrounds that both predispose them to emotional disturbance and which also make food available for neurotic purposes.

b. *Personality type:* Much has been written about the personality of the obese. In literature, the typical "fat person" types such as Falstaff and Sancho Panza are described as jovial, congenial people who are happy and outgoing. Most investigators seem to agree that this is *not* the usual picture presented by the obese patient. Rather it is the exception, and when present, it is usually a coverup for deeply hidden repressed feelings of inferiority and inadequacy. There are few symptoms, somatic or psychological, that are so disturbing to interpersonal relations as obesity. There have been attempts to describe specific character traits of fat persons. Shorvon and Richardson (77) note that obese patients typically manifest great anxiety, aggressivity, giddiness, irritability, and depressive and hysterical pictures; they are usually immature, impulsive and labile with a poorly developed emotional life. They are unable to accept their inner urges. Schopbach and Matthews (75) found obese persons to be excessively passive, dependent, intolerant of responsibility and unable to express aggression. Furthermore they found a marked sexual confusion particularly in boys who they felt were also excessively dependent upon their mothers. Ray (63) described the female obese patients whom he studied as introspective, self-conscious, ill at ease in their social adjustment and as having marked feelings of inadequacy. Bruch (11) found them isolated and seclusive; she also found in their Rorschach test responses that these patients were unusually preoccupied with "size" and that this suggested how symbolically important largeness was to them. These patients often felt that food equalled safety and that if they did not eat, they would lose weight, which would decrease their size and cause them to become ill and weak. Bruch found that they feared becoming skinny because physical size and bulkiness conveyed a feeling of strength; fat was a protective wall against the world. Bychowski (15) feels that obese persons have great difficulty in expressing hostility, and they manage to do this only via the oral incorporative introjective mechanism, a type of unconscious *cannibalism.* In summary, then, every author in the field expresses the opinion that obese persons are to some extent emotionally disturbed, but there is little agreement about the specific nature of the disturbance.

Many psychoanalytic authors have described *specific* developmental sequences to account for the development of obesity. They describe the obese person's history as follows (11, 75, 77). Their maladjustments date back to a disturbed early home environment and unhappy childhood. On entering school, obese children often do not interact well with their peers, either socially or in group games; they are often made the butt of cruel jokes and ridicule (11). They prefer passive games and entertainment (56). Because they exercise less than other children and eat more, their obesity becomes aggravated. They lack ambition, and tend to be non-aggressive and overdependent. They show poor social adaptation and learn skills slowly. Their parents do not encourage initiative. Forty per cent of obese children are enuretic above the age of six. The persistence of bottle feeding past the age of five is not unusual. Bruch found them to be usually good students scholastically although they tend to be slow and methodical in their work. Bronstein (9) demonstrated that obese children have a general acceleration of mental and physical growth, 50 per cent of those studied having superior intelligence and only 25 per cent inferior intelligence. Bruch (11, b) found advanced growth in stature, accelerated skeletal maturation, and normal or early

puberty in boys who grew obese before adolescence. According to Gill (32) obese patients informed their parents of everything they did in their teens, and continued to do so even after they were married, which he felt indicated their marked immaturity. Bruch further noted that by the time he reaches adolescence the situation of the obese child becomes acute because of the physical and social aspects of obesity; it is at that age that he becomes ashamed of his overweight, and at the same time his overprotective mother frequently tires of her overindulgence and starts to "nag and needle" her adolescent youngster to lose weight. The parent-child relationship becomes tense; the cast, however, is set, and the child is no longer able to achieve independence. He may make weak attempts at self-assertiveness via temper tantrums and sulkiness, but these are not effectively aggressive moves. Bruch concludes that obesity becomes valuable as a means of keeping himself helpless and justifying his failures in life.

In spite of the suggestion of the existence of specific personality types by the aforementioned studies, it is the present authors' impression that there is no specific predictable personality picture that characterizes obese patients. The many descriptions of the personality of the obese patient could fit any number of neurotic and psychotic patients, and could be best summarized as describing any emotionally disturbed patient. It is not unusual to find obesity in psychotics as well as in patients with various neurotic symptoms. Apparently the most commonly noted psychodynamic characteristic of these patients is that they have a great deal of conscious anxiety and fear which is closely related to their various psychological defenses and symptoms. The authors agree with Rennie (65) who has stated the problem succinctly: "obesity can be regarded as a component of a neurosis, the physical expression of which is the accumulation fat." The nature of that neurosis is highly variable.

The unconscious meaning of overeating and obesity

Adlersberg and Mayer (2) have summed up the almost unanimous finding of various authors about the subjective cause of overeating and obesity in their observation that the 299 patients they studied felt that their condition was "due to factors beyond their control"; by this they meant that they were unable to stop overeating for reasons which they did not understand. Most authors seem to agree that overeating represents an attempt either to achieve substitute gratification or unconscious impulses or to reduce intolerable anxiety resulting from various emotional conflicts. Hamburger (40) believes that the emotional impulses plaguing the obese patient fall under one of the following headings: nonspecific emotional tension, substitute gratifications in intolerable situations, severe underlying emotional illnesses such as depression and hysteria, and addiction to food. Kisch (48) feels that the chief characteristic about the emotional life of obese patients, whatever their emotional problems, is that they lack gratification from their life experiences, a situation he describes as "anhedonia".

Many workers (5, 10, 17, 18, 41, 62, 67) have proposed specific impulses, conscious and unconscious, which seek gratification through overeating, and a variety of conflicts, which result in anxiety against which hyperphagia supposedly constitutes a defense. Almost all conceivable psychological impulses and conflicts have been accused of causing overeating, and many symbolic meanings have been assigned to food. The following is an attempt to list some of the unconscious meanings of overeating, food, and obesity that have been proposed:

a. *Overeating may be:*
   - a means of diminishing anxiety, insecurity, tension, worry, indecision.
   - a means of achieving pleasure, gratification, success.
   - a diversion from monotony and an empty life.
   - a means of achieving social success and acceptance.
   - a means of relieving frustration, deprivation and discouragement.
   - a means of expressing hostility, which hostility may be conscious, unconscious, denied, or repressed. Repressing the hostility produces anxiety and even more hostility.
   - a means of diminishing feelings of insecurity and inferiority.
   - a means of self-indulgence.

a means of rewarding oneself for some task accomplished.
a type of defiance, rebellion against authority and control, an attempt at independence.
a means of submitting, e.g., to parental authority.
a means of self-punishment and self-degradation oft-times in response to guilt.
a means of diminishing guilt, which guilt may itself be due to overeating.
a means of exhibitionism.
a means of attaining attention and care.
a means of justifying failure in life.
a means of testing love and affection.
a means of counteracting a feeling of being unloved.
a means of distorting reality.
a means of identifying with a fat parent, usually an obese mother.
a means of sedating oneself.
a means of avoiding competition in life.
a means of avoiding the change in the status quo.
a means of proving inferiority and justifying self-depreciation.
a means of avoiding maturity.
a means of diminishing fear of starvation, particularly in poor people.
a means of consciously fulfilling the desire to become fat, for being fat may equal health, or being fat may please the parent.
a means of handling anxiety from infantile oral frustration.

b. *Overeating may serve:*
as a substitute for love, affection and friendliness (food = love).
as a substitute for showing love and affection.
as a substitute for pregnancy.
as a substitute for a heterosexual existence, i.e., protection against men and marriage.

c. *Obesity may mean:*
1) Obesity achieves the closing of the gap between achievement and reality, i.e. very often obese people are failures who have no success except at eating and gaining weight. A big body to them means strength, a type of greatness and bigness achieved by becoming more special and stronger than others. They have a megalomanic image of themselves. Loss of weight will disturb this patient because loss of weight means a loss of special power (11).

2) Obesity results in feelings of inferiority, inadequacy and shame. These feelings and the obesity associated with them then can be used to justify all the failures in interpersonal relationships which the obese patient has. They may be used as a rationalization to avoid any further contact with people and threatening situations.

d. *Overeating or food may be symbolically:*
representative of pre-Oedipal mother conflict.
a type of an alimentary orgasm.
expression of an unsatisfied sexual craving.
expression of destructive sadistic impulses.
expression of penis envy and a wish to deprive the male of his penis, i.e., an unconscious association between food and phallus.
expression of a fantasy where overeating results in impregnation.
expression of pregnancy whereby abdominal fat = pregnant figure.
pathologically strong oral libido being gratified in an unsublimated way.
a means of possessing a "part-object" like a penis or breast.
a seed or impregnating agent.
devouring an ambivalently loved object.
a defense against threatening unconscious feminine or masculine wishes.
an expression of exhibitionistic impulses.
the mother, with eating being an attempt to orally incorporate the mother.
a desire to feed at the breast.
an attempt to modify an underlying depression.
an indication of an early disturbed mother-child relationship.

It is difficult to describe all the many specific psychological factors that have been proposed as being associated with obesity. The present authors believe that the great number and variety indicate that *any* emotional conflict may eventually result in the symptom of over-

eating; it is their conclusion that the psychodynamic factors causing obesity are *nonspecific*. Brosin (10) also has noted that psychiatric experience demonstrates that a wide variety of conflicts and psychiatric syndromes may be associated with obesity. While many obese patients may have some features in common, Brosin cautions that it is unsafe to generalize about the *common* factors. In conclusion, it appears that the only psychopathological generalization that can be made with confidence about obese patients is that they are individuals whose life pattern is conflictual and anxiety ridden.

Summary of psychological factors

While it is evident that psychological factors are crucial to the development of obesity, the exact nature of the mechanism by which such psychological factors result in obesity has not yet been clearly explained. The food regulating mechanism is susceptible to influence from the environment, and it has been shown that cultural, family and psychodynamic factors may all contribute to the development of obesity. Although many investigators have proposed *specific* family histories, precipitating factors, personality structures and unconscious conflicts as causing obesity, the present authors have concluded that overweight persons may suffer from every conceivable psychiatric disorder and come from a variety of disturbed backgrounds. Thus, obese patients may be characterized as emotionally disturbed persons who, because of the availability of the overeating mechanism in their environments, have learned to use hyperphagia as a means of coping with their psychological problems.

Discussion

The authors feel that at the present stage of knowledge in the field of psychology and psychoanalysis the problem of obesity is best described on a relatively simple and fundamental level. The assumptions underlying the authors' concept of obesity are largely derived from learning theory (20, 52, 79). The authors view overeating as learned behavior which usually is a means of reducing anxiety. They do not feel that it is necessary to postulate that the excessive eating of food represents a regression to the oral stage nor to attach symbolic meaning to eating.

Two types of abnormal overeating are seen clinically. The first is the overeating that results from abnormal feelings of hunger or appetite, while the other type of overeating is not associated with excessive hunger. This distinction has often been noted, and one type of overeating has been attributed to the "gratification of frustrated impulses", while the other type is generally associated with the "avoidance of anxiety". In some patients one pattern predominates, but frequently both patterns are seen in the same patient. Overeating associated with anxiety seems to be the more common. It may be speculated that different mechanisms may account for the different types of hyperphagia.

The overeating that results from a disturbance in hunger or appetite may be explained in terms of conditioning and the involvement of the hypothalamic feeding centers. Appetite is highly conditionable and may become associated with any number of stimuli or situations that are not directly concerned with eating. Appetite may come to be elicited by previously neutral stimuli as a result of pairing such stimuli with hunger and feeding situations. For example, the stimulus 6 p.m. originally does not evoke the desire to eat, but does so after one has regularly eaten his dinner at this hour. The desire to eat may also be aroused by ideational and affective stimuli as a result of pairing or conditioning. Thus if hunger and fear are repeatedly paired, as they might be in a neglected infant, then it may be expected that in later life the feeling of fear or loneliness will evoke appetite or a desire to eat. While it is true that such a pairing of an unpleasant affective state or situation with hunger in our culture is most likely to occur in infancy, i.e., during the "oral stage", it may also occur in later life as during a prison-camp experience or due to socio-economic crises. Again while it may be speculated that a rejecting type of mother would be most likely to create a situation of associated fear-hunger, a specific type of mother is not the crucial and determining factor in establishing the conditioned hunger pattern. Also while in later life arousal and frustration of certain impulses may evoke the conditioned hunger reaction,

and while it is important to identify such impulses in the course of psychotherapy, it is conceptually confusing to attribute the overeating due to conditioned hunger to an attempt to obtain "substitute gratification". The only impulse gratified by such overeating is appetite.

It seems likely that the hypothalamic appetite centers and their connections form the structural substrate for the mechanism of conditioned hunger. Originally the appetite centers are "triggered off" only by the sensations due to nutritional deficiency, but due to the process of conditioning, impulses from other sensory and cortical channels may become capable of stimulating these centers and evoking a desire to eat.

However, the most common type of overeating seen in obese patients is associated with no conscious increase in hunger or appetite, but has an uncontrollable, compulsive quality. This compulsive type of overeating can be explained in terms of drive reduction. It has been shown that any act which reduces a drive is rewarded or reinforced and thereby learned. In other words, a response such as eating, which *reduces* the *hunger drive*, tends to be repeated whenever the drive is aroused. In simple terms, one eats whenever one is hungry because the eating abates hunger.

It has also been demonstrated that emotions such as fear or anxiety also constitute drive states, the reduction of which mediates the learning and maintenance of responses. Anxiety may be reduced in a number of ways involving normal as well as psychopathological mechanisms. In our culture fear or anxiety is a very important behavioral determinant. Experimental evidence indicates that eating has fear reducing effects, i.e., the act of eating diminishes anxiety states. Whereas hunger is the normal, and largely unlearned, drive that motivates eating responses, the arousal of the learned fear drive may also cause an individual to eat. The act of eating then is reinforced or "rewarded" by the reduction of either drive. Thus a person may learn to eat in response to anxiety as well as in response to hunger. According to the authors' hypothesis, a person's habitual use of eating to reduce anxiety, over and above his use of eating to reduce hunger, can lead to *compulsive* eating and obesity.

The tension reducing effects of eating can account for the persistence of obesity. The act of overeating has two consequences: the immediate effect of anxiety reduction and the long range effect of causing a distressing accumulation of adipose tissue. The immediate, rewarding anxiety *reducing* effects of overeating which reinforce the act are dominant over the future self-defeating and anxiety *eliciting* effect of the resultant obesity, especially if the individual is not aware of the process. Thus the cycle of anxiety and overeating becomes extremely difficult to interrupt. Such obese patients who try to diet suffer a great deal of anxiety generated in part by the removal of the anxiety reducing mechanism of eating, which they tend to reduce by breaking their diet and eating again.

The authors feel that the question of why certain patients choose overeating as against other means to diminish anxiety cannot be satisfactorily answered by postulating specific character structures, psychodynamics and family constellations, nor is the specific source of anxiety the determining factor. In their clinical experience, the authors have seen obese patients whose anxiety stems from such widely divergent sources as conflicts involving sex and aggression, culturally determined factors such as status and interpersonal relations, as well as from underlying psychotic processes. Since they run the gamut of psychopathology, it is beyond the scope of this paper to describe the numerous and varied sources of the emotional conflicts and anxiety that motivate the compulsive eating that results in obesity. Such psychodynamic considerations, while extremely important for understanding the total problem of obesity and for managing the obese patient, are on a different level of description from the present discussion. The authors' conception of obesity, while on a more operational level of description, is consistent with many of the various psychodynamic formulations of psychopathology. Perhaps one of the important factors predisposing patients to choose overeating as a means of diminishing anxiety is the availability of this mechanism in their environment. Thus individuals who

come from homes where food is stressed or whose mothers used food as a means of appeasement or control, as suggested by Bruch (11), might have the increased probability of exploiting the anxiety reducing effects of food should they ever become subject to emotional disturbance and anxiety. Certainly, this conceptualization does not rule out the contributory roles of constitution, heredity and other somatic factors as part of the total picture of obesity.

In summary, the overeating of obesity seems to be of two types. The first is a result of excessive conditioned hunger which is elicited by non-nutritional factors. The second is a psychogenically determined compulsive type of hyperphagia which has as its result the reduction of anxiety. Many authors have attempted to demonstrate specific family constellations, personality types and unconscious impulses as being the psychic causes of obesity. The authors feel that the people affected by obesity typically have some degree of personality disturbance and/or emotional conflict which may be of *any* type or severity. They might be described as being emotionally disturbed persons usually coming from emotionally deprived and disturbed backgrounds. The specific choice of obesity as a symptom has not been clearly explained, but availability of the overeating mechanism as determined by the family background and the significance of food in the home situation seem important. Both the utilization of food as a means of diminishing anxiety as well as hyperphagia due to an excessive conditioned appetite are learned reactions which do not necessarily date back to the oral stage of development. The resistance of obesity to therapeutic intervention may be accounted for by the anxiety reducing effects of eating.

Summary

Obesity was described from a psychosomatic viewpoint. The pertinent literature pertaining to both the somatic and the psychological factors was reviewed and evaluated. It was concluded that the ultimate cause of the great majority of cases of obesity is psychologically determined hyperphagia. The authors presented a comprehensive formulation of the problem of obesity. They suggest that the overeating of obesity is of two types. The first is the result of conditioned hunger whereby eating becomes associated with stimuli and situations not related to the nutritive function. The second type is a psychogenically determined compulsive type of hyperphagia which has the purpose of reducing anxiety, which anxiety is aroused by any emotional conflict. The authors feel that the personality structure, family history, precipitating events and psychodynamic conflicts that may be associated with hyperphagia and obesity are non-specific.

BIBLIOGRAPHY

1. Abraham K.: A short study of the development of libido viewed in the light of mental disorders. In Selected Papers. London: Institute for Psychoanalysis and the Hogarth Press, 1942.
2. Adlersberg, D., and Mayer, M. E.: Results of prolonged medical treatment of obesity with diet alone, diet and thyroid preparation, and amphetamine and diet. *J. Clin. Endocrinol., 9:* 275, 1949.
3. Alexander, F.: The influence of psychological factors upon gastrointestinal disturbances. *Psychoanalyt. Quart., 3:* 501, 1934.
4. Armstrong, D. B., Dublin, L. I., Wheatley, G., and Marks, H. H.: Obesity and its relation to health and disease. *J. A. M. A., 147:* 1007, 1951.
5. Bayles, S.: Psychiatric contributions to the treatment of obesity. *Am. J. M. Sc., 219:* 104, 1950.
6. Behnke, A. R., Osserman, E. F., and Welham, W. C.: Lean body mass. *Arch. Int. Med., 91:* 585, 1953.
7. Boothby, W. M., and Sandiford, L.: Summary of the basal metabolism data on 8614 subjects with special reference to the normal standards for the estimation of the basal metabolic rate. *J. Biol. Chem., 54:* 783, 1922.
8. Brobeck, J. R.: Neural regulation of food intake. *Ann. New York Acad. Sc., 63:* 6, 1955.
9. Bronstein, L. P., Wexler, S., Brown, A. W., and Halpern, L. J.: Obesity in childhood; psychologic studies. *Am. J. Dis. Child., 63:* 238, 1942.
10. Brosin, H. W.: Psychiatric aspects of obesity. *J. A. M. A., 155:* 1238, 1954.
11. a. Bruch, H.: Psychological aspects of reducing. *Psychosom. Med., 14:* 5, 1952.
    b. Bruch, H.: Obesity in childhood. I. Physical growth and development of obese children. *Am. J. Dis. Child., 58:* 457, 1939.
    c. Bruch, H.: Obesity in childhood. II. Basal metabolism and serum cholesterol of obese children. *Am. J. Dis. Child., 58:* 1001, 1939.
    d. Bruch, H.: Obesity in childhood. III. Physiological and psychological aspects of the food intake of obese children. *Am. J. Dis. Child., 59:* 739, 1940.
    e. Bruch, H.: Obesity in childhood. IV. Energy expenditure of obese children. *Am. J. Dis. Child., 60:* 1082, 1940.
    f. Bruch, H.: Obesity in childhood and personality

development. *Am. J. Orthopsychiat., 11:* 477, 1941.
g. Bruch, H.: The psychology of reducing. *Quart. J. Child Behavior, 3:* 350, 1951.
h. Bruch, H.: Psychiatric aspects of obesity in children. *Am. J. Psychiat., 99:* 752, 1943.
i. Bruch, H.: Obesity in relation to puberty. *J. Pediat., 19:* 365, 1941.
j. Bruch, H.: Psychological aspects of obesity. *Psychiatry, 10:* 373, 1947.
k. Bruch, H.: The psychosomatic aspects of obesity. *J. Mt. Sinai Hosp., 20:* 1, 1953.
l. Bruch, H.: Food and emotional security. *Nerv. Child, 311:* 55, 1944.
m. Bruch, H.: Role of the emotions in hunger and appetite. *Ann. New York Acad. Sc., 63:* 68, 1955.
n. Bruch, H.: When not to diet. *Colliers,* Feb. 5, 1954.
o. Bruch, H.: Fat children grown up. *Am. J. Dis. Child., 90:* 501, 1955.
12. Bruch, H., and Touraine, G.: Obesity in childhood. V. The family frame of obese children. *Psychosom. Med., 2:* 141, 1940.
13. Bruch, H., and Waters, I.: Benzidrene sulfate (amphetamine) in the treatment of obese children and adolescents. *J. Pediat., 20:* 54, 1942.
14. Burdon, A. P., and Paul, L.: Obesity: A review of the literature stressing the psychosomatic approach. *Psychiat. Quart., 25:* 568, 1951.
15. Bychowski, G.: On neurotic obesity. *Psychoanalyt. Rev., 37:* 301, 1950.
16. Cleghorn, R. A.: The interplay between endocrine and psychological dysfunction. In *Recent Developments in Psychosomatic Medicine.* Ed. by E. Wittkower and R. Cleghorn. Philadelphia: J. B. Lippincott, 1954.
17. a. Conrad, S.: The problem of weight reduction in obese women. *Am. Practitioner, 5:* 38, 1954.
b. Conrad, S.: The psychologic implications of overeating. *Psychiat. Quart., 28:* 211, 1954.
c. Conrad, S.: Resistance of the obese to reducing. *J. Am. Dietet. As., 30:* 381, 1954.
d. Conrad, S.: The psychological causes and treatment of overeating and obesity. *Am. Practitioner, 3:* 438, 1952.
18. Coriat, I. H.: Sex and hunger. *Psychoanalyt. Rev., 8:* 375, 1921.
19. Danforth, C. H.: Hereditary adiposity in mice. *J. Hered., 18:* 153, 1927.
20. Dollard, J., and Miller, N. W.: *Personality and Psychotherapy.* New York: McGraw-Hill, 1950.
21. Dorfman, W.: Challenge of obesity. *New York J. Med., 56:* 1642, 1946.
22. a. Dubois, E. F.: *Basal Metabolism in Health and Disease.* 3rd Edition. Philadelphia: Lea and Febiger, 1936.
b. Dubois, E. F.: In Obesity: Chairman, C. Forkner. *New York Med., 12:* 587, 1956.
23. Dublin, L. I., Jimenis, A. O., and Marks, H. H.: Factors in the selection of risks with a history of gall bladder disease. *Proc. A. Life Insurance Med. Directors, 21:* 34, 1934.
24. Dublin, L. I., and Marks, H. H.: The influence of weight on certain causes of death. *Human Biol., 2:* 159, 1930.
25. Frazier, S. H., Faubion, M. H., Giffin, M. E., and Johnson, A. M.: A specific factor in symptom choice. *Proc. Staff Meet., Mayo Clin., 30:* 227, 1955.
26. Freed, S. C.: Psychic factors in the development and treatment of obesity. *J. A. M. A., 133:* 369, 1947.
27. Freud, S.: *A General Introduction to Psychoanalysis.* New York: Boni and Liveright, 1920.
28. Freyburgh, R. H.: A study of the value of insulin in undernutrition. *Am. J. Med. Sc., 190:* 28, 1935.
29. Gastineau, C. F., and Rynearson, E. H.: Obesity. *Ann. Int. Med., 27:* 883, 1947.
30. Gastineau, C. F., Rynearson, E. H., and Irmisch, A. K.: Treatment of the fat and the lean. *J. A. M. A., 139:* 86, 1939.
31. Gilbert-Dreyfus, L.: L'Obesite Paradoxale: Syndrome Psycho-Somatique: *Presse méd., 56:* 749, 1948.
32. Gill, D. J.: The role of personality and environmental factors in obesity. *J. Am. Dietet. A., 22:* 398, 1946.
33. Grafe, E., and Graham, D.: *Ztschr. Physiol. Chem., 73:* 1, 1911.
34. Goldner, M.: Obesity and its relation to disease. *New York J. Med., 56:* 2063, 1956.
35. Gray, H.: Obesity; a challenge to the psychiatrist. *Stanford Med. Bull., 1:* 195, 1943.
36. Grossman, M. I.: Integration of current views on the regulation of hunger and appetite. *Ann. New York Acad. Sc., 63:* 76, 1955.
37. Grossman, M. I., Cummins, G. M., and Ivy, A. C.: The effect of insulin on food intake after vagotomy and sympathectomy. *Am. J. Physiol., 149:* 100, 1947.
38. Gurney, R.: The hereditary factors in obesity. *Arch. Int. Med., 57:* 557, 1936.
39. Hall, J.: Some conditions of anxiety extinction. Unpublished doctoral dissertation, Columbia Univ., 1953.
40. Hamburger, W. W.: Emotional aspects of obesity. *M. Clin. North America, 35:* 483, 1951.
41. Hecht, M. B.: Obesity in women: A psychiatric study. *Psychiat. Quart., 29:* 203, 1955.
42. Hertig, A. T., and Sommers, S. C.: Genesis of endometrial carcinoma: study of prior biopsies. *Cancer, 2:* 946, 1949.
43. Hetenyi, G.: *Deutsches Arch. klin. Med., 17:* 134, 1936.
44. a. Hetherington, A. W., and Ranson, S. W.: Hypothalamic lesions and adiposity in the rat. *Anat. Rec., 78:* 149, 1940.
b. Hetherington, A. W., and Ranson, S. W.: The spontaneous activity and food intake of rats with hypothalamic lesions. *Am. J. Physiol., 150:* 143, 1949.
45. Hochman, S.: Mental and psychological factors in obesity. *Med. Record, 148:* 108, 1938.
46. Jones, M. C.: A laboratory study of fear; the case of Peter. *Ped. Sem., 31:* 308–315, 1927.
47. Joslin, E., and associates: G. F. Baker Clinic, and Metropolitan Life Insurance Co.: *Diabetes in the 1940's.* New York: Metropolitan Life Ins. Co. Press, 1940.
48. Kisch, F.: Uber die essecht schweradiposen. *Ztschr. klin. med., 132:* 504, 1937.
49. Levy, R., White, P. D., Stroud, W. D., and Hillman, C. C.: Overweight: its prognostic significance in relation to hypertension and cardiovascular renal disease. *J. A. M. A., 131:* 951, 1946.
50. Master, A. M., Dublin, L. I., and Marks, H. H.: The normal blood pressure range and its clinical implication. *J. A. M. A., 143:* 1464, 1954.
51. Mayer, J.: Regulation of energy intake and the body weight: The glucostatic theory and the

lipostatic hypothesis. *Ann. New York Acad. Sc., 63:* 15, 1955.
52. Mowrer, O. H.: *Learning Theory and Personality Dynamics.* New York: The Ronald Press Co., 1950.
53. Moss, W. T.: Common peculiarities of patients with adenocarcinoma of the endometrium: with special reference to obesity, body build, diabetes hypertension. *Am. J. Roentgenol., 58:* 203, 1947.
54. a. Newburgh, L. H.: Obesity. *Arch. Int. Med., 70:* 1033, 1942.
b. Newburgh, L. H.: I. Energy metabolism. *Physiol. Rev., 24:* 674, 1942.
55. Newman, M. H., Freeman, F. N., and Holzinger, N. J.: *Twin: A Study in Heredity and Environment.* Chicago: Univ. Chicago Press, 1937.
56. Nicholson, W. M.: Emotional factors in obesity. *Am. J. Med. Sc., 211:* 443, 1946.
57. Quigley, J. B.: The role of the digestive tract in regulation of the ingestion of food. *Ann. New York Acad. Sc., 63:* 76, 1955.
58. Plummer, W. A.: Body weight in spontaneous myxedema. *Tr. Am. A. Study Goiter,* p. 8, 1940.
59. Portis, S. A.: Life situations, emotions, and hyperinsulinism. *Res. Publ. A. Nerv. Ment. Dis., 29:* 317, 1950.
60. Ranson, S. W.: Some functions of the hypothalamus. In *Harvey Lectures of 1936–37.* Baltimore: The Williams & Wilkins Co., 1937.
61. Ranson, S. W., Fisher, C., and Ingram, W. R.: Adiposity and diabetes mellitus in a monkey with hypothalamic lesions. *Endocrinology, 23:* 175, 1938.
62. Rascovsky, A., de Rascovsky, M. W., and Schlossberg, T.: Basic psychic structure of the obese. *Internat. J. Psycho-Analysis, 31:* 144, 1950.
63. Ray, H. M.: The obese patient; A statistical study and analysis of symptoms, diagnosis, and metabolic abnormalities, sex difference-treatment. *Am. J. Digest. Dis., 14:* 153, 1947.
64. Reeve, G. H.: Psychological factors in obesity. *Am. J. Orthopsychiat., 12:* 674, 1942.
65. Rennie, T. A. C.: Obesity as a manifestation of personality disturbance. *Dis. Nerv. System, 1:* 8, 1940.
66. a. Richardson, H. B.: Obesity and neurosis. A case report. *Psychiat. Quart., 20:* 400, 1946.
b. Richardson, H. B.: Obesity as a manifestation of neurosis. *Med. Clin. North America, 30:* 1187, 1946.
67. Richardson, J. S.: The treatment of maternal obesity. *Lancet, 1:* 525, 1952.
68. Robinson, A. M., and Norton, J. M.: Estimation of corticosteroid-like substances in human urine. *Endocrinology, 7:* 321, 1950.
69. Rony, H. R.: *Obesity and Leanness.* Philadelphia: Lea and Febiger, 1940.
70. Rynearson, E. H.: The problem of obesity. *Proc. Inst. Med. Chicago, 15:* 35, 1944.
71. Rynearson, E. H., and Gastineau, C. F.: *Obesity.* Springfield: C. C. Thomas, 1949.
72. Rynearson, E. H., and Hildebrand, A. G.: Metabolism and diabetes; review of certain recent contributions. *Arch. Int. Med., 68:* 134, 1941.
73. Schick, A.: Psychosomatic aspects of obesity. *Psychoanalyt. Rev., 34:* 173, 1947.
74. Schopbach, R. R., and Angel, J. L.: Obesity: An etiologic study. *Psychiat. Quart., 27:* 452, 1953.
75. Schopbach, R. R., and Matthews, R. A.: The psychological problems in obesity. *Arch. Neurol. & Psychiat., 54:* 157, 1945.
76. Short, J. J.: The increase of electrocardiographic changes with obesity. *Proc. Life Extension Examiners, 1:* 82, 1939.
77. Shorvon, J. H., and Richardson, J. S.: Sudden obesity and psychological trauma. *Brit. M. J., 4634:* 951, 1949.
78. Silver, S., and Bauer, J.: Obesity, constitutional or endocrine? *Am. J. Med. Sc., 181:* 769, 1931.
79. Spence, K. W.: Theoretical interpretation of learning. In *Handbook of Experimental Psychology, Ch. 18.* S. S. Stevens, Ed. New York: John Wiley, 1951.
80. Sperling, M.: The role of the mother in psychosomatic disorders in children. *Psychosomat. Med., 11:* 377, 1949.
81. Spotlight on business: The big bulge in profits. *Newsweek Magazine,* July 23, 1956.
82. Strang, J. M., McClugage, H. B., and Evans, F. A.: Further studies in the dietary correction of obesity. *Am. J. Med. Sc., 179:* 687, 1930.
83. Stevenson, J. A. F.: Effects of hypothalamic lesions on water and energy metabolism in the rat. In *Recent Progress in Hormone Research,* Vol. IV. Ed. by G. Pincus. New York: Academic Press, 1949.
84. Tepperman, J., Brobeck, J., and Long, C. N. H.: The effects of hypothalamic hyperphagia and of alterations in feeding habits on the metabolism of the albino rat. *Yale J. Biol. & Med., 19:* 855, 1943.
85. Van Noorden, C.: *Metabolism and Practical Medicine.* Chicago: W. T. Kieener and Co., 1907.
86. Walker, H. C.: Polycythemia and obesity. *Arch. Int. Med., 93:* 951, 1954.
87. Watts, J. W.: The influence of the cerebral cortex on gastrointestinal movements. *J. A. M. A., 104:* 355, 1935.
88. Wilens, S. L.: Bearing of general nutritional state on atherosclerosis. *Arch. Int. Med., 79:* 129, 1947.
89. Williams, R. H.: Relation of obesity to the function of the thyroid gland. *J. Clin. Endocrinol., 8:* 257, 1948.

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AN EXAMPLE OF THE PSYCHOPATHOLOGY OF RELIGION

The Seventh-day Adventist Denomination[1]

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Introduction

The Seventh-day Adventist denomination is a relatively small Protestant sect, another of the strange phenomena appearing in the first-half of the 19th century. Its crucial years fall within the period of the 1840's. Generally, this period might be roughly described as one of tension and transition for America; it was the period of sectional tension preceding the Civil War, as in the slave holding-abolishionist controversies; it was also the era when the Mexican War satisfied the national urge for expansion, but threatened the national ideal; and likewise saw the early implementation of the industrial revolution with its organized endeavors, which in particular affected the New England farmer's status of individualism. The latter had already been threatened by the decline in productivity of his land, and the exodus of those looking for prosperity in the west. For New England in particular it was the period of exuberant revolt against Puritanism with the appearance of writers who asserted a sort of American independence in arts and letters. Of the transcendental writers, of course, there is Emerson; other idealists, like Thoreau, who despaired of transforming the world according to their ideals, simply withdrew to literal isolation. While Mary Baker Eddy was just getting married for the first time in 1843 and did not become influential until 1865, William James credits Emerson and the Transcendentalists as being one of the doctrinal sources for the "Religion of Healthy-mindedness", of which Christian Science is one of the most extreme examples. There were the communal withdrawals as in the Brook Farm experiment. In 1844, Joseph Smith, founder of Mormonism, was killed by an Illinois mob; he had, inspired by his peculiar visions, led his followers out of New England to find a Promised Land which would be uniquely theirs.

For Europe there were such crises as the revolutions in Germany of 1848; Darwin and the Utilitarians brought rational thinking to a belief in evolutionary progress which would bring the "new earth" in this life; the effect of Kant's idealism which emphasized faith and intuition had produced such results as described by Randall: "tests of truth which generations of scientists had built up went by the board, and men were free to believe anything which the interests of the whole of human nature impelled them to believe. Almost any kind of faith had been made intellectually respectable." There were the philosophies of history which taught, "history revealed the steady march of mankind toward some far-off divine event . . . the task of the wise man is to study the past to discover those laws of development, and then play his part in the further unfolding", and while this school's great systematizer, Hegel, died in 1835, its influence was seen, for example, on Marx's Manifesto published in 1848.

The Seventh-day Adventists seems to represent one sort of reactionary plunge into New England Calvinistic excesses. The fundamental beliefs of this church include a core of orthodox ones common to Protestant sects deriving from Calvin and Wesley: such as, belief in the Trinity, salvation through faith, redemption through Christ's death and resurrection; allegiance to God before allegiance to state. The Bible is studied and applied as the literal rule-book; or a Christian's purpose in life is to serve God with strict discipline and, like other derivatives of Calvinism, without profane distractions. To this orthodox core of beliefs have been added the distinctive Seventh-day Adventists ones: such as, the observance of the seventh day Sabbath; the belief in the imminent literal second coming of Christ; and baptism by immersion (held in common with the Baptists). Also with similar Protestant

[1] Read at the 120th Meeting of the Schilder Society, the Society for Psychotherapy and Psychopathology, New York City, November 20, 1952.

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sects, it believes it alone has the truth and that its followers alone constitute the "elect"; it is evangelical, epitomizing this spirit by the text, "This gospel of the kingdom shall be preached in all the world for a witness unto all nations; and then shall the end come." (Matthew 24:14)

The denomination reported a world membership of 756,712 in 1950; it maintains 43 publishing houses; 5,436 schools, including 283 college and secondary schools; and 163 medical institutions. Between 1900 and 1950, over six thousand missionaries were sent out. For ironical interest, it might be mentioned that the church's first missionary was sent to Switzerland in 1874.

Miller and the Second Advent Movement

This denomination's belief in the imminent second advent begins with William Miller, 1782–1849, who was descended from New England Baptists and lived in rural Washington County in northern New York. He was self-educated and was particularly interested in deism and law. He is supposed to have read by the light of burning pine knots, a practice which kept his father worrying lest the house burn down. Miller kept a diary, acted as a community scribe, was the local Justice of Peace for 20–30 years, and had two years of army service during the War of 1812, being discharged with the rank of Captain. He married, fathered ten children and adequately supported his family by farming. In 1814, he found the world "seamy and sinister", and he found himself "disgusted with man's character". "Taking the name of God in vain", a habit he had acquired in the army, suddenly seemed a horrible offense. He became preoccupied with a violator's relation to the Just Being, but he failed to find answers to his questions in Nature or in Providence. He was in despair: "Annihilation was a cold and chilling thought . . . accountability was sure destruction to all . . . I tried to stop thinking, but my thought would not be controlled . . . I murmured and complained, but know not of whom . . . I mourned without hope . . . God by His Holy Spirit opened my eyes . . . I saw Jesus as a friend . . . and the Word of God as a perfect rule of duty . . . I immediately felt how lovely such a Being must be . . . ." In the following 15 years, Miller studied the Bible verse by verse with the help of Cruden's Concordance, trying to understand the meaning of every sentence. As early as 1818, his study had convinced him that the end of the world would come about 1843, but he was uncertain what he should do about this impending catastrophe. About 1830, he talked to his friends and began to accept "preaching" invitations and was licensed as a Baptist minister in 1833. His followers "came out" of a number of Protestant churches, but the Millerites were sort of ex- or AWOL Baptists, Methodists, etc., and had no formally organized denomination.

Miller's reliance on Cruden suggests how he developed his theories; i.e., he tied up statements picked from most any Biblical writer to develop a theory with some far-fetched results, even though he aimed to be literal and logical and never presumptuous. His interpretations are essentially in agreement with those held by Biblical scholars who study the prophecies, except that he diverged in his interpretative-prediction as to what would happen when the great prophetic periods ended. His interpretation is built up in part from the following: Daniel, who shifts between anxiety for the state of his own soul and for the destiny of the Jews, also had been concerned with some all-inclusive cataclysmic "ending". Daniel 8:14 states: "Unto two thousand and three hundred days; then shall the sanctuary be cleansed"; then Daniel 9:24 states: ". . . seventy weeks are determined upon thy people . . . from the going forth of the commandment to restore and to build Jerusalem unto Messiah . . ." where "determined" can also be translated "cut-off". It is not a difficult leap, to interpret "cut-off" as implying a larger whole, and the preceding longer time period is the 2,300 days; then both time prophecies would begin at the same time, and the "commandment" is usually considered that given by the Persians in 457 B.C. Counting prophetic time as a day for a year, brings the 70 weeks or 490 years to A.D. 33, which is the date of Christ's crucifixion. Calculation would then close the 2,300 day time period about 1843, although a checking of chronology set the exact date on October 22, 1844. Miller interpreted the "sanctuary" to

mean the earth, which would only be cleansed at Christ's second coming.

Miller and his associates lectured all over the Northeastern States, teaching small groups or holding camp meetings attended by thousands. They attracted a surprisingly large number of followers. As would be expected, his startling theories also aroused hostility, notoriety and ridicule and made good newspaper copy. While some of his followers undoubtedly went in for bizarre behavior, Miller himself taught that the great event should be awaited with self-searching humility, along with such practical admonition as settling debts, making confession and restitution for dishonest dealings, etc.

There were reactions from the "lunatic fringe"; statistics from three New England State Hospitals for the years 1842–1844 show that out of the 199 patients admitted during that period who were diagnosed "religious excitement", in 59 exposure to Miller's beliefs was given as the precipitating cause of their insanity. These 59 patients constituted about 4 per cent of the total admissions (1,516) for this period. When the second advent did not occur in 1844, the Millerites dissolved with the exceptions of a few small groups. Miller, by 1844, was ill and losing his eyesight, and he died in 1849, still believing, "The Bridegroom is coming; no mistake. . . .We shall soon see Him for whom we have looked and waited. . . . God will raise up those to whom He will commit the direction of His cause."

Since the Seventh-day Adventist denomination evolved from a few faithful Millerite groups, it began historically with a period of anticipation, then disappointment, and a resulting almost complete dissolution. It had come out of the "fallen Babylon" only to find itself not ascended up with Christ as hoped, but left to face the bitterness of the disappointed faithful and the ridicule of the "unfaithful". Generally, its beginnings in reality contributed toward a paranoid outlook.

In 1845, one of the faithful Millerites understood where Miller was in error. The earthly sanctuary with its ceremonial laws had been patterned after the heavenly sanctuary. It was really the sanctuary in Heaven Daniel meant. Therefore the supreme event which occurred in 1844 was that Christ entered the most holy place of the heavenly sanctuary to act as mediator in the final judgment, the Hebrew day of atonement being a foreshadow of this event. The ten commandments, it was asserted, are within the ark in the most holy place. Concentration of this awesome fact illuminated another error, namely: the 4th commandment states "Remember the Sabbath day to keep it holy . . . for in six days the Lord made heaven and earth . . . and rested the seventh day"; and if God said the seventh day, he meant literally the seventh day, not the first day. (This new "illumination" is based largely on the three angels' messages of Revelation 14.) This added truth pulled together a few groups of reconverted Millerites who were now Seventh-day Adventists. The denomination was not formally organized until 1863, when with its headquarters in Battle Creek, Michigan, its constituency was 125 churches with 3,500 members. From 1846 on James White and his wife Ellen G. White carried the responsibility of leadership.

Ellen G. White

She was born one of twin girls in Maine in 1827 (and died at the advanced age of 88 in 1915). Her parents were devout Methodists who had eight children. When she was 9, an older girl threw a stone at her and fractured her nose. The immediate results of this accident were: three weeks in a stupor from which she awakened with no memory of the accident and remaining at home for two years convinced she was going to die. At 11, when she went back to school, she could "not retain" what she learned, and even though the girl who injured her was trying to help her in reading and writing "my hand trembled . . . the letters ran together . . . perspiration broke out . . . I had to yield to my feebleness . . . the teacher was patient . . . but sad to see my laboring under serious disadvantages." Therefore she stayed home and helped her father in his hatmaking when her feebleness permitted. Some of the long-term consequences were difficult nasal breathing and a disfigured appearance.

She had picked up a scrap of newspaper which mentioned that someone in England was preaching that the earth would be consumed in about 30 years—"I was seized with terror . . . and prayed to be ready." Hell was very real

to her: ("the fiery billows would roll to the surface, the writhing victims who would shriek, How long, O Lord, how long? . . . the answer would thunder down the abyss . . . thru all eternity . . . again the molten waves would engulf the lost, carrying them down in the depths of an ever restless sea of fire").

In 1840 she first heard Mr. Miller; she believed, but "a sadness rested in her heart" and "it was impossible to make anyone understand my feelings." During a camp meeting she took courage from Esther's story (I will go unto the King, etc.—Esther 4:16) and felt her burden lifted. Immediately she was alarmed, even though "Jesus seemed very near", since she felt she had no right to be "joyous and happy . . . I feared I was different . . . was shut out from the perfect joy of holiness . . . I felt the justice of God eclipsed His mercy and love . . . I thought of the eternally burning hell . . . I thought my sins too great to be forgiven . . .". This conflict went on for some months with emphasis on her fear of making public confession and prayer, which she felt God demanded of her. She had a dream about people flocking to a temple where there was a central pillar; she was left alone and terrified; then she saw Jesus who took out a green cord and gave it to her with advice to stretch it to the utmost; she cherished the cord to her bosom and thought it represented faith. She told her mother who said, "Ellen, you are only a child; . . . perhaps Jesus will be preparing you for some special work." Soon after, she "prayed out" in a Millerite meeting (not a Methodist) when "everything seemed shut out for me, but Jesus and His glory . . . and I lost consciousness for what was passing around me . . . the Spirit of God rested on me with such power . . . I was unable to go home . . . my mother was sure it was the wondrous power of God . . . my views of the Father were changed . . . now He was a kind and tender parent . . . rather than a stern tyrant . . . my heart went out to Him in a deep and fervent love . . . naturally proud and ambitious . . . I might not have been inclined to give my heart to Jesus had it not been for the sore affliction that had cut me off from the temptations and vanities of the world . . . I longed to tell the story of Jesus' love . . . but felt no disposition to engage in common conversation with anyone . . . I felt like coming to God like a child coming to its father." She related her experience in churches with amazing effects; and she persisted with such zeal in gathering others for prayer that some "thought me beside myself."

Her reaction to the 1844 disappointment was essentially that it was a trial to test the faithful in a world filled with scoffers, the scornful, and a world mobilizing to present opposition to the truth. She continued to feel that God expected her to "rise above herself" and spread the "truth", but she was not frightened—"I coveted death as a release from responsibility." Courage would return after such experiences as being struck in the heart by a ball of fire or finding herself able to speak in a meeting after a six months' loss of her voice.

In 1846, she was married to James White (she was then about 19 years old) and between the years of 1847 and 1860 gave birth to four sons, two of whom died in infancy or childhood. She and her husband had no permanent home before 1860, going from church to church, being supported by donations and seasonal work. Pregnancy did not seem to deter her from her appointed duty. The children were left to the care of church members. She felt that being separated from her children was a sacrifice God demanded. On some occasions when one of them was ill, she felt God was punishing her for her pleasure in her children. As she recounts their struggles, Divine guidance sustained them and/or afflicted them for their own good. They were poor; members constantly required admonition for "backsliding"; the Devil was ever ready to stir up trouble; their publishing ventures faced a series of crises. When Mr. White was ill with cholera, her prayers were heard and he recovered; therefore she packed him off to speak at a meeting. That the "cramps" returned did not detract from the miracle. Both were afflicted with illness. Mr. White had "heart trouble" and bronchitis among other illnesses, and there were times when he was so weak that he could speak only for 40 minutes. Mrs. White had fainting spells; circa 1853 it is said that a doctor diagnosed a swelling on her eyelid as cancer, but afterwards he announced that "heart trouble" would cause her death before the cancer could prove fatal. At the same time, the left side of her body was cold and numb.

Some years later, she had a complete hemiparesis. On each occasion, when her life was despaired of, she was suddenly healed through prayer. Mr. White died circa 1880. Mrs. White seemed to enjoy better health during the last half of her life. She travelled over the world, wrote voluminously and gave away everything she had. She did own a house in California during her old age and is quoted as being grateful for such material comfort.

For the first 20 years or so of her ministry, Mrs. White was subject to "visions" and trances. Urian Smith, a defender of the divine origin of these "visions" wrote: "no disease would take effect by repeatedly suspending the functions of the lungs, muscles and every bodily sense from 15 to 180 minutes...." While receiving a "vision" she was "in obedience to that alone, the eyes would see, the lips speak and the limbs move...." Mrs. White was a true prophet because the "fruits" of her revelations are 1) they tend to the purest morality; 2) they lead us to Christ; 3) they lead us to the Bible; 4) they have brought comfort and consolation to many hearts.

The following is given as an example of one of Mrs. White's visions as she describes it: "The Lord gave me the following view in 1847, while the brethren were assembled on the Sabbath, at Topsham, Maine. We felt an unusual spirit of prayer. And as we prayed, the Holy Ghost fell upon us. We were very happy. Soon I was lost to earthly things and was wrapped in a vision of God's glory. I saw an angel flying swiftly to me. He quickly carried me from the earth to the Holy City... (the angel took her to view the heavenly sanctuary, lifting veil after veil as she progressed). I saw that the holy Sabbath is... the separating wall between the true Israel... and unbelievers... the Sabbath is a great question to unite the hearts of God's dear, waiting saints.... In the time of trouble we all fled from the cities and villages, but were pursued by the wicked. ... Dark heavy clouds came up and clashed. ... But there was one clear place of settled glory, whence came the voice of God like many waters...." Or, in December, 1848: "... The Lord gave me a view of the shaking of the powers of the heavens.... The powers of heaven are the sun, moon and stars. They rule in the heavens. The powers of heaven will be shaken at the voice of God... the atmosphere parted... then we could look up through the open space in Orion, whence came the voice of God... the holy city will come down through that open space.... War, and rumors of war, sword, famine and pestilence are the first to shake the powers of earth.... I saw that the shaking of the powers in Europe is not... the shaking of the powers of heaven, but it is the shaking of angry nations...."

Obviously her influence is not due to intellectual appeal. The content of these visions is essentially a jumbled outpouring of Biblical phrases, as such phrases were manipulated to support doctrine in the endless sermons and prayer meetings of the period. However, once the premise of her divine inspiration is accepted, this mere repetition and popularizing of doctrinal cliches can make them sound fearful and authoritative. Perhaps the almost nonsensical confusion increases the effect of the supernatural.

Once her visions covered the distinctive doctrines, I believe they became more utilitarian. In the congregation she might note a Mr. A, for example, who was well dressed but who was sitting back waiting for the Lord to provide while his child went in rags; God revealed to her that He wanted Mr. A to go to work. By about 1900, she no longer went through the rigamarole of special revelation and exerted influence by the usual kind of practical vision —something like urging that the next step was to open a new school or mission station. My impression is that her relation to the congregation was something like that of an anxious, possessive, nagging mother; and it would seem that her persistence and insistence sometimes did get the faithful to sort of lift themselves by their own boot straps. Circa 1879 Mrs. White reports that one of the brethren suggested to her that it was time "to take a broader view", inferring that she was enclosing the work of the church in her arms. During her final illness, she is said to have fondled her books "like an affectionate mother"; one of her last pronouncements concerned her books: "they are truth and they are righteousness and they are an everlasting testimony that God is true." As late as 1914, she heard voices at night, but these voices just repeated "Advance".

Included in the Seventh-day Adventists'

peculiar beliefs is the doctrine of Health Reform, theoretically established to keep the body a worthy "temple for the Holy Spirit". Miller wrote a week before the 1844 advent date: "Let us imitate Daniel, who would not defile himself with the king's meat. Let us abstain from every article of food which was unclean to the Jews, for the Lord had a reason for his laws. Eating swine's flesh is mentioned as something abominable in each of the last two chapters of Isaiah .... We can lay down no rule for others, but hope our readers will all keep the body under, as Paul did." So the foods which were unclean to the Jews were proscribed. I am not sure how Exodus 23:19 —"Thou shalt not seethe a kid in his mother's milk"—got omitted from the proscription. Then vegetarianism was strongly advised, although never made a doctrinal "must", on the basis that God gave Adam to eat of the fruits, grains, etc., and only allowed man to eat after the flood when it was expedient and because God intended to shorten man's life span—and even though its time on earth is to be brief the latter is an important point. Other "notions" about food fads were picked up from contemporaries. The Graham bread, whole grain cereal *et al.* were really quite an innovation; however, the doubts about using milk and eggs on the theory that these were, or soon would be, diseased left the faithful to this teaching, getting protein from beans and peanuts—healthwise a dubious practice. Stimulants, intoxicants, narcotics and condiments were proscribed; as applied to alcohol and tobacco, it is a doctrinal "must", while the use of coffee, tea, spices, etc., is merely advised against. As to clothing: generally clothing is to cover and conceal, not to reveal or adorn; and it must not interfere with nature—hence no jewelry (including wedding rings), no tight corsets, low necks, short skirts, feathers, or artificial flowers. In order to preserve the spirit from defilement, dancing, theater, moving pictures, etc. are strictly forbidden. Reading novels is seriously frowned upon. More or less, reading should be confined to the Bible and denominational publications, along with special books sanctioned officially.

Health has always received much attention in Seventh-day Adventist thinking, as in Christian Science. Mrs. White's early triumphs were getting the sick to "take up their beds and walk", but from about 1870 her emphasis shifted to health reform in general which was a preventive program of sorts. At least it seemed an advance over the early acceptance of illness as supernaturally imposed and/or miraculously removed. As noted she was continually rising above illness to do her duty, and the same fortitude was expected of church members. On the other hand, there is the impression that illness and real and neurotic illness were not differentiated, was the one non-guilt producing reason for resting from duty. Also, illness seemed the one "bodily" manifestation which might sometimes be pampered—leading to an hypochondriacal outlook.

After the church was more firmly organized, it established sanitariums which specialized in hydrotherapy. It might be noted that the sanitariums give excellent hydrotherapy "treatments", one of the church's few useful "good-doing" activities. Drug therapy was discouraged, but the "body" could be massaged, douched, fomented, its colon could be irrigated and so on, thus washing away sin like baptismal immersion of the Baptists. These treatments often attracted a clientele of wealthy neurotics, and the sanitariums sometimes proved profitable. Medical work, being one of the least peculiar practices, was used as an "opening wedge" for proselytizing. The ambitious young people born into the religion gravitated toward medical work because it offered a bridge from mysticism to science, as well as the most lucrative vocation for a Sabbath keeper.

Among the Seventh-day Adventists today education in general is considered important, and it is almost taken for granted that its youth will go to college, but to a Seventh-day Adventist college of course.

Although its educational curricula have been "wanting" as to study of the classics, philosophy and so on, and its teachings on history, for example, may carry a denominational bias, its schools include work programs because of belief in the character building aspects of communal work and partly because of financial necessity—i.e., the institutions are largely maintained by this kind of work, and students often have to "work their way through school". Regardless of its incentives, the schools do have the kind of program which offers very practical

experience. Both educational institutions and sanitariums have become centers for denominational communities, where routine can be adjusted to fit the peculiar habits, where life is isolated but pleasant and unified. Of course, the greatly improved methods of travel and communication have to some extent broken down this isolation.

Discussion

From its beginning, church members have tended to cohere, adding doctrinal accretions which increase its separateness, regarding the rest of the world as "outsiders". A believer's primary contact with the "outside" is to convert it to the "truth", and the "truth" teaches that very soon all the non-converted "outside" will unite to persecute the faithful. Of course, the faithful believe the "outside" is trying to tempt them into wickedness; therefore believers must be vigilant to keep out of temptation's way. And, as all Christians should, believers "love" their neighbors and in reality will do anythying needed to "help". As a whole, the Seventh-day Adventists relate themselves to the "outside" as honest, industrious, conforming individuals. For a group who tend to regard themselves as martyrs, both in the present and in the future, they seem particularly adept in avoiding the kind of situations which might literally set them apart as "martyrs". For an example: The church is against "bearing arms", but its draftees avoid becoming defiant kinds of conscientious objectors. While praying that their boys will be miraculously spared persecution for their beliefs, they organize and train potential draftees in first aid and send them into service with a statement of their religious scruples and a request for assignment to a medical corp. This is readily allowed and also takes care of the Sabbath problem. During the last war, the church missionaries accepted the assistance of the "powers that be" in getting out of dangerous areas; and at present all of its missionaries have been removed from China.

With this suspicion of the "outside" which may in part have begun in the geographical isolation of the early members where the "outside" was suspect as being essentially unknown, church members are theoretically restricted, from releasing aggression towards the "outside" except as aggression is implied in trying to "convince them of the truth". Aggression is internalized; the doctrinal beliefs enforce self-denial; but as Randall observes about the early Calvinists: "Discipline tended to lapse from a self-imposed concentration to a prying interference with others" (6, p. 159). Under the guise of being a brother's keeper, assisting the weak, warning about potential temptation *et al.*, members of Seventh-day Adventist and all such sects spy, gossip, and generally tend to be do-good busy-bodies in their relations with fellow members. An example of this "spying" attitude might be cited: circa 1865 a Mr. Brinkerhoff became disturbed by seeing "fashionable hats, bonnets and artificials" worn at a meeting, and he saw this as evidence of apostasy in the church. When he was told that "outsiders" not members had been so adorned, his criticisms ceased.

From a group of individualists, the denomination has become highly structured with considerable power being given to its General Conference. Apparently the early organization was on occasion resented. As an extreme instance, a "brother" B. F. Snook criticized the General Conference; he begins his apology—"Brother White: permit me an unworthy worm of the dust to address the brethren and sisters as follows: I wish to relieve my mind before you and God, by confessing that I now feel that I have been led by the Wicked One in my movements of late . . . especially in my opposition to the Body . . . I thought I was hampered and chained and longed for a freedom that I now see would result in anarchy. I felt the General Conference Committee was domineering . . . becoming a tribune Papacy . . . now I believe God is in our present system . . . my heart's desire is to conform to it . . . and to live in subjection to God and to my brethren."

The General Conference controls local groups by sending study guides for all ages and all occasions; its periodicals are censored to keep the content in line with the church bias, and to keep out such facts as would be unsafe for innocent believers to read. It "sells" the mission work in every possible way and pressures to keep up contributions. It gives out considerable moral exhortation, but the church does not seem to have effected any rule-making moral proscriptive power since the time of Mrs.

White's influence. Since its peculiar doctrines more or less solidified in the 19th century, it tends to hold to antiquated absolutes while it happily adapts itself to all the more modern innovations. As a trivial example, the early injunction against movies is still enforced while radio and T.V. are accepted. Naturally this adherence to a "truth" applicable to a former period makes endless inconsistencies. An obscure minister stating he wanted Sunday law enforcement can stir up considerable anxiety when it is quoted as evidence of a "sign" of the beginning of "time of trouble", and it may serve as a rallying fear for increased piety, mission zeal *et al.* since it relates concretely to the early fear-inspiring prophecies. A real threat to civilization, like Hitlerism for example, tends to find the denominational voice inarticulate beyond a trite statement, generally on a level with "we said perilous times were coming". In general, the church seems to meet real danger with common sense courage while the "jot and tittles" and the "gnats in the eye" are strained at with avidity.

In the early period of the church, conversion and devotional services seemed to have stimulated a sort of "being-at-oneness" ecstasy although there was never the kind of "Holy Roller" acting out. It would seem that this type of experience reflected the religious habits of the period, in which there was a good deal of hysteria, rather than something unique within the Seventh-day Adventist group. The old jargon and the form of the prayer meeting continued for years as a duty, even though much of it was stereotyped cant. The cant tended to be put in such literal, unimaginative and uninspiring form that there was little for contemplation. The strength of the denomination seems related in part to its pseudological appeal to certain contention-prone individuals, in part to its supplying a framework within which a person can lose himself in doing good works and thereby keep so busy that thinking is avoided; then there is the more general sort of strength which comes to members of any group who cling together for protection against a common enemy.

The mission converts aside, it seems to attract those who have reached a hopeless kind of despair and who want to lose themselves in a "cause" which gives purpose for doing and promises a future reward. But the same explanations would fit the acceptors of any religion and, for that matter, any converts to existentialism and communism except that a God would not be in command. Individuals seem to stay within the church of the Seventh-day Adventist for such reasons as: conviction that it is logically right and true; to keep the peace which comes from conforming to parental training; or the security of staying with the known, and with the friends who have the same background, rather than to revolt and meet the potential dangers of the unknown.

In spite of the fact that it maintains that its basic doctrine is unchangeably right, the church has given up its peculiar aloofness at least in practice, and the members live and move comfortably in this world even though they abstain from alcohol, tobacco *et al.* Time and events have proved the "sure word of prophecy" in error quite often; hence there is silence on the literal kind of prediction previously enjoyed. As an example of its adaptation to current interests, the following advertisement in the "church" page of a local newspaper might be noted: "Life can begin at your age . . . Learn how your life can be made satisfying and rewarding despite disappointment or handicaps. A free public lecture by Pastor William A. Fagal, director-speaker of the Faith for Today, coast to coast telecasts . . . Carnegie Hall."

Because the writer's aunt sent her notices, she recognized Pastor Fagal as an Adventist (apparently there is still fear of the outsider's prejudice to the name Seventh-day Adventist), instead of, say, the next "ad" interested in "Regenerating powers of a Perfected Personality on Society and Vice Versa". Sincere effort is being made to replace former Seventh-day Adventist jargon with intelligent thinking. The teaching of the terrifyingly near second advent seems to be becoming attenuated into the kind of attitude commonly accepted: something like living each moment prepared for the end (whether end of my life, my society or my world does not have to be particularized) while improving each moment, improving my family, my church, etc., as though life will go on forever. As with most new and "different" institutions, once the uncertain beginning and the period of acute fanaticism are gone through,

the institution becomes more moderate, while the fanatical "fringes" continue to schism off and the "indifferent" drift off in the direction opposite to the fanatics.

While this kind of denomination has much in common with "ideologies" and by its practices makes itself a "minority group" cohering together with a barrier between it and the "outside", it does not have to deal with the real difficulties facing the "minority" groups determined by race and/or color. Joining the church is voluntary as is also separating from it. Even the youth join only presumably voluntarily on reaching the "age of accountability", and moral persuasion and dread of "hurting" respected authority, while exerting a powerful influence, do not constitute coercive force.

Discussion on Psychopathology of Seventh-day Adventism

With all of its peculiarities this denomination does not seem to have any unique psychopathology which sets it apart from Protestant religions or many "isms". It seems just another variation on Freud's generalization that religion for the ordinary man is a system of doctrine and pledges that explain the riddle of the world, and assures man that a solicitous Providence watches over him as a greatly exalted father to make up for any shortcomings in this life by a future existence. However, brief comment might be made on the belief in the imminent second coming of Christ and the destruction of the world.

The Bible contains many promises of an Advent; the first coming of the Messiah in the Old Testament is still the hope of some orthodox Jews; and from the time of the apostles on, the Christian church has periodically believed in a literal second advent. While the more usual interpretation tends toward looking for a spiritual, symbolic return, or an emphasizing of "I go to prepare a place for you" among the heavenly mansions instead of on the "I will come again" (John 14:1, 2), the following is an example of a more literal expectation of return. Referring to the Church in the 10th century: "The Church itself . . . appears as the victim of the same anarchy in which lay society is weltering; all evil appetites range unchecked, and . . . such clergy as still retain some concern for religion and for the salvation of the souls committed to their charge mourn over the universal decadence and direct the eyes of the faithful towards the spectra of the end of the world and of the 'Last Judgment' " (7, p. 418). This points up an outlook which is relevant to that of the Seventh-day Adventists, i.e., the world is so wicked and hopeless that the only solution is destruction of everything except for the special few who escape by meeting the requirements of the Last Judgment. Mrs. White reports a conversation she had with a Methodist minister circa 1845. The minister asked the pertinent question as to why she chose to believe in the speedy second coming of Christ to destroy poor sinners instead of choosing to live a long and useful life. Her answer was that she longed for the coming of Jesus and "no devil would tempt her", thereby conveniently evading the implications of the question. Apparently there always is a sort of righteous vindictiveness in the ascetic, altruistic defensive mechanism against aggression as developed according to Christian ideals, although the church has not always been content to put this righteous retribution in the hands of God.

According to Russell, the Stoics believed that originally there was fire; then the other elements—air, water and earth—emerged; then, sooner or later, there would be a cosmic conflagration when all would again become fire; and for them, this was to be a recurring phenomenon (7, p. 277). Periodically a newspaper will talk about the possibility of the world's ending when the sun burns out or a comet collides with the earth; "cranks" not particularly integrated with religion also come out with notions about impending doom. Then serious astronomers suggest that current discoveries indicate that the earth evolved from fiery gases and will eventually return to the same condition. Involved in man's questions about the reasons for existence (a silly example, "I couldn't understand why God had made the world at all" remarks a self-retired clergyman in Evelyn Waugh's "Decline and Fall") is this groping for surety about beginnings and endings; living things are born and die, and most men at some time feel uncertain about the surety of their own existence and possibly try to project this uncertainty onto the whole world.

In psychotherapy certain "neurotics" who

have an uncertain status, while being potentially aggressive, are not overtly so, being preoccupied with fear of the "end". This may emerge in terms of the end of the world, but seems to refer primarily to the fear of and/or desire for their own dissolution. And, of course, endings and beginnings, and/or inability to begin and end anything from a simple concrete task to character patterns, are particular problems to some "neurotics". Not infrequently impulsive destructive fantasies become related to struggles over these endings and beginnings. For a very simple example: a seven-year-old boy in play therapy shows the kind of anxiety which keeps him trying to exact promises for the future with a resulting failure to do much with what is immediately available. His usual gambit is, "this is only for me, *right?*" He left his last foster home because of wetting, soiling and firesetting, among other things. On his rare visits to his mother, he has apparently been urged to pray that God will make him good and clean and warned that God will punish. He has talked during play sessions occasionally about how God could kill everybody, fantasied that God killed everybody but "us"—but then God goes on to kill "us" also. At times he tries to defy the natural state of affairs by such play as squirting water all over the windows on a sunny day; then he wants an absolute confirmation that "it is raining" not that "it looks like it is raining". When he plays, he tends to become very destructive. He has shown some improvement and in therapy has been playing with water. Recently, influenced by the Hallowe'en motif, he fantasied he was a cat and the therapist was a pumpkin; he would crawl inside the pumpkin and pull the lid down, but the candle would not burn him because he was magic. He fantasied this retreat into the womb while he used candy "corn" to give him ferocious teeth with which he played at biting. Later he blew up a balloon (previous use of balloons had been for grandiose anal fantasies) and tossed it up, saying it was magic and would never break; it was a weather balloon. He announced "Bad news!—end of the world!"; the balloon saw lightning which would destroy the world. But the balloon which he directed took "another look around" and gave a tempered prediction that just the jungles and the animals were to be destroyed. Then he exploded a couple of balloons by forcing water into them; rescued the third one from the "machine"; blew it up with air; tied it to the other one, and announced they were friends. This pair "reported", "Good news!—no destruction!"

It might be noted that Freud too, in his later years, sometimes sounded like a pessimist: "I can listen without taking umbrage to those critics who aver that when one surveys the aims of civilization and the means it employs, one is bound to conclude that the whole thing is not worth the effort. . . . My courage fails me . . . at the thought of rising up as a prophet before my fellowmen . . . I have no consolation to offer them . . . men have brought their powers of subduing the forces of nature to such a pitch that by using them they could now very easily exterminate one another to the last man. They know this—hence arises a great part of their current unrest, their dejection, their mood of apprehension." (2, p. 142, 144). Or, ". . . The pleasure principle . . . is in conflict with the whole world . . . it simply cannot be put into execution . . . the possibilities of happiness are . . . limited from the start by our constitution. It is much less difficult to be unhappy. Suffering comes from our own body which is destined to decay . . . from the outer world which can rage against us with the most powerful and pitiless forces of destruction; and finally from our relations with other men" (2, p. 126). "Against the dreaded outer world one can defend oneself only by turning away in some other direction." (2, p. 28).

While not trying to "hold a brief" for religion, it does seem that some religions do come nearer to giving reasons for existence and do offer more effective controls for man's aggression than do most systems of beliefs. Also, it seems that some people, perhaps the emotionally immature, require something more concrete, which elaborates rewards and punishments, than the more rational and generalized ideologies offer (such as the democratic ideal or liberalism, for example). Also as William James notes (3), even the religions of "healthy-mindedness" satisfy only certain types of optimists; the religions of despair with their quota of fear and punishment seem to have a stronger and deeper meaning for most people.

BIBLIOGRAPHY

1. Festinger, L., *et al.*: *When Prophecy Fails*. Minneapolis: University of Minnesota Press, 1956.
2. Freud, S.: *Civilization and Its Discontents*. Authorized translation by Joan Riviere. New York: Cape & Smith, 1930.
3. James, W.: *The Varieties of Religious Experience; a Study in Human Nature*, being the Gifford lectures on natural religion delivered at Edinburgh in 1901–1902. New York, London: Longsmans, Green, 1902. 38th Impression, 1935. Modern Library Edition: New York: Modern Library, 1936.
4. Nichol, F. D.: *The Midnight Cry, a Defense of William Miller and the Millerites*. Takoma Park, Washington, D. C.: Review and Herald Publishing Association, 1944, 560 p. (Ministerial reading course selection for 1945, Ministerial Association of Seventh-day Adventists) Bibliography: pp. 519–548.
5. Nichol, F. D.: *Ellen G. White and her Critics*. An answer to the major charges that critics have brought against Mrs. Ellen G. White. Takoma Park, Washington, D. C.: Review and Herald Publishing Association, 1951.
6. Randall, J. H., Jr.: *The Making of the Modern Mind*. Rev. ed. A survey of the intellectual background of the present age. Boston, New York: Houghton Mifflin Co., c1940.
7. Russell, B.: *A History of Western Philosophy and Its Connection with Political and Social Circumstances from The Earliest Times to The Present Day*. New York: Simon and Schuster, 1945.
8. Smith, U.: *The Visions of Mrs. E. G. White*. Battle Creek: Seventh-day Adventist Publishing Association, 1868. Brief answers to 52 objections to the visions and teachings of Mrs. White. A reprint of material published shortly before in the *Review and Herald*.
9. White, E. G.: *Early Writings of Ellen G. White*, 4th American ed. Washington, D. C.: Review and Herald Publishing Association, 1945, 316 p. (Christian home library).
10. White, E. G.: *Life Sketches of Ellen G. White*, being a narrative of her experience to 1881 as written by herself; with sketch of her subsequent labors and of her last sickness, comp. from original sources. Mountain View, Calif., Kansas City, Mo.: Pacific Press Publishing Association, 1915.
11. White, E. G.: *Scriptural and Subject Index to the Writings of Mrs. Ellen G. White*. Mountain View, Calif., Omaha, Neb.: Pacific Press Publishing Association, c1926.

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CONVULSIONS IN MULTIPLE SCLEROSIS

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Focal or generalized epilepsy is a fairly rare symptom in multiple sclerosis (5, 13). Of more than eighty multiple sclerosis patients observed during the last fifteen years in our department, this complication has only been observed in three cases. These three patients are being reported because of the rarity of this manifestation and the unusual course and the clinical problems involved in their management.

Presentation of Cases

Case 1: B. Z., male, aged 16 years, was seen for the first time in our out-patient clinic in December, 1949, because of difficulty in walking during the previous two years and the recent appearance of tremor of his arms. A few months before examination he had experienced a transitory blurring of vision in his left eye. His family and personal history were non-contributory. On examination, his gate was ataxic and bilateral pyramidal signs were found. There was an intentional tremor in his left arm, and instability during the Romberg test. No sensory disturbances were noted. There was some pallor of the left optic disc, and the diagnosis of multiple sclerosis was made. During the next few months his condition deteriorated. In August, 1950, he had to stop his work, and a month later he suffered from a number of generalized epileptic attacks with loss of consciousness. Therefore he was admitted to our department for examination in September, 1950. A left hemiparesis and marked ataxia in arms and legs in addition to the previous signs were found. The sense of vibration was diminished in the lower part of the body, and there was a marked pallor of the optic discs. The x-ray of the skull was normal. The electroencephalogram revealed a generalized dysrhythmic and convulsive record with spike and wave formations (fig. 1a, b). The cerebrospinal fluid was under normal pressure but contained 100 mg. % protein with positive (++) Pandy and Nonne tests. In order to exclude the existence of a space-occupying lesion a pneumoencephalogram was performed, but the only pathological finding was a dilatation of the third ventricle (fig. 2). A number of generalized convulsions were observed while he was in the department, and it was concluded that the epileptic attacks were a manifestation of multiple sclerosis. The patient was discharged and put on anti-convulsive therapy.

During the next months there was further deterioration in his condition. In April, 1951, there was a spastic paresis of his limbs with loss of the sense of position in his toes, astereognosis in both hands, dysarthric speech, horizontal and vertical nystagmus, and left peripheral facial paresis. Because of the advancing disability he was admitted to a chronic sick home. There he had a number of epileptic attacks; and twenty-four hours previous to readmission to our department in April, 1952, he went into a status epilepticus which lasted one hour. After this he lapsed into coma, and when brought to our department he was semicomatose. He returned to a state of consciousness, but died a few days later. No permission for autopsy could be obtained.

Case 2: M. O., female, aged 38, was admitted to our department for the first time in June, 1953, because of convulsive seizures. Her family and personal history were non-contributory. In 1949, she had been hospitalized in a University Hospital abroad because of an acute onset of dizziness, disturbed equilibrium, and vomiting, which had been aggravated by the change in head position. The examination then revealed a very ataxic gate, nystagmus, absent abdominal reflexes and left temporal pallor of the optic disc. All the laboratory examinations were negative. The acute disturbances disappeared after three weeks, and a tentative diagnosis of multiple sclerosis was made at the time of her discharge from that hospital. In 1950 a neurologist found ataxia of arms and legs, intentional tremor of the right arm, and bilateral pyramidal signs. Falling to the right was noted during the Romberg test. Since that time personality changes have been noted, and the patient became moody and irritable. Three weeks before admission to our department, in June, 1953, she suffered from an attack of loss of consciousness with convulsions and loss of urine. On admission, the patient was hypomanic and full cooperation could not be obtained. On examination, horizontal nystagmus, vivid reflexes, especially on the left side, a possible weakness of the right arm and a definite weakness of the right leg, absent abdominal reflexes and slight adiodochokinesis in the left arm were found. The eye ground revealed bitemporal discoloration of the optic discs. Because of lack of cooperation no eye field examination could be performed. The x-ray of the skull was normal, but the electroencephalogram revealed a dysrhythmic and generalized convulsive record. The cerebrospinal fluid as well as the blood and urine was normal. In April, 1954, she was admitted for the second time. The previous day her temperature had been 102.02°F., and she had a series of Jacksonian epileptic attacks. She lost consciousness, turned her head to the right and there were clonic movements in her right arm. These attacks, which lasted a few minutes, recurred a number of times, and she finally went into a status epilepticus. When admitted she was confused and incontinent, and there was, in addition to the previous signs, a marked right hemiparesis with right facial weakness and positive Babinski and Oppenheim signs on the right side. In a few days her confusion subsided, and the strongly euphoric and manic behavior of the patient became evident. The right hemiparesis regressed somewhat, but the py-

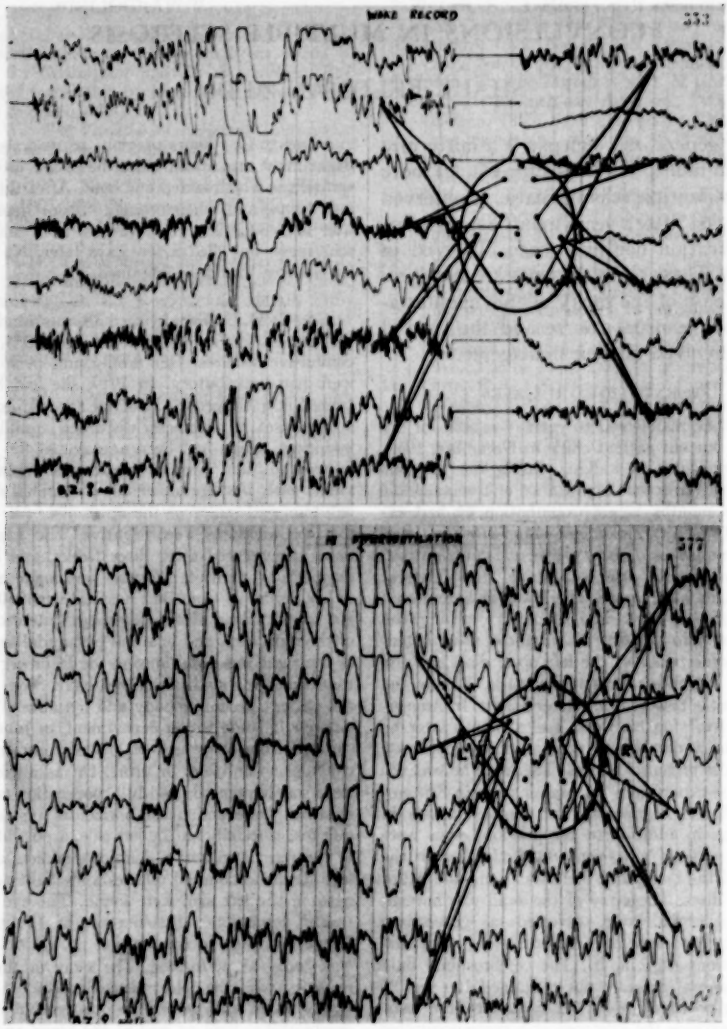

FIG. 1

ramidal signs persisted. The lumbar puncture revealed clear fluid under pressure of 160 mm. of water, which was normal in content. Two electroencephalographic records showed a severe generalized disturbance with focal accentuation in the left temporal region (fig. 3a). In order to rule out the presence of a space occupying lesion in addition to the underlying disease, a left carotid arteriography was performed, which was normal. A pneumoencephalography revealed marked widening of the sulci above the right hemisphere and dilatation of the lateral ventricles which was more marked on the left, indicating a generalized atrophy of brain substance. There was no deviation of the ventricular system (fig. 4). Seven weeks later, in June, 1954, she was admitted for the third time. As reported by her husband, she had complained of headaches for the last few weeks. She had stayed in bed during the previous week, and her husband noted that she had weakness of her *left* leg, with weakness of her *left* arm appearing later. Five days before admission, she became somnolent, confused and incontinent, and during the last twenty-four hours she was unconscious. When admitted she was in deep coma and there was no neck rigidity. The pupils were equal, reacted to light and the optic discs were as on the previous examination. Her blood pressure was 130/70, and pulse 100 per minute. The electroencephalogram showed a severe generalized disturbance as observed in coma, with

flattening of the potentials in the right hemisphere (fig. 3b). A lumbar puncture revealed clear fluid under a pressure of 320 mm. of water, which was of normal content. Because of the sudden appearance of the left hemiparesis and the state of coma, a ventriculogram was decided upon, and the patient was transferred to the neurosurgical department. There, occipital burr holes were made, and after the opening of the dura, a chronic subdural hematoma was found on the right side. This was evacuated with the aid of normal saline washings. At the end of the operation the patient recovered consciousness. The next day her condition was satisfactory and the cerebrospinal fluid pressure was 245 mm. of water. During the next few days the left hemiparesis receded, and this improvement continued until her discharge three weeks after the operation. At that time bilateral pyramidal signs existed and the electroencephalogram showed a severe generalized disturbance with an accentuation in the right temporal region. The euphoria and behavior disturbances were unchanged. In the last two years her condition has deteriorated further, and the right hemiparesis has progressed. At present she is negativistic and very emotionally unstable with both depressions and explosive behavior.

FIG. 2

Case 3: M. B., male, an engineer, aged 39, was admitted to our department for the first time in 1952 because of difficulty in walking. His previous history was non-contributory. In 1950 he suffered from vertigo and vomiting for two weeks. At that time nystagmus was also found. Six months prior to admission he had diplopia for one week. On examination, horizontal nystagmus, a slight left hemiparesis with hyperreflexia, and a questionable Babinski on that side were found. The x-ray of the skull and the electroencephalogram were normal. The diagnosis of multiple sclerosis was made, and it was decided to administer cortisone. The treatment had to be stopped, however, after a few days because of a common cold with temperature. After he left the hospital his condition improved somewhat, and he continued his work. When readmitted, in 1954, there were pyramidal signs in the left leg as well as ataxia of the left leg and the right arm. He received ACTH for ten days, but the treatment had to be stopped because of a rise in blood pressure. His condition improved after he left the hospital, but in 1955 he complained of difficulty in writing and walking, and a paresis of his left leg was noted in addition to the previous signs. He received ACTH therapy, with the initial dose of 40 mg. daily, for three weeks, and some diminution in the ataxia was noted. Six months before his fourth hospitalization in 1956, he was admitted to another hospital because of a sudden deterioration in his condition associated with a high temperature due to cholecystitis. He was completely paralyzed in both legs and had urinary retention and bulbar signs. The acute signs improved after three days, the paraplegia regressed, but he could not return to his work. A very marked worsening in his condition was noted when he was examined in our department. His speech was dysarthric, there was a severe paraparesis with bilateral pyramidal signs, ataxia of his legs and arms, horizontal nystagmus and urinary difficulties. There were also changes in his personality. Another trial with ACTH, 40 mg. daily, was then undertaken. On the fourth day after the initiation of this therapy, however, he had a Jacksonian seizure which involved his left arm and the left half of his face. At that time he could not speak, but apparently did not lose consciousness. The next day he had two similar attacks which lasted approximately two minutes each, and which were accompanied by transitory aphasia. A fourth attack occurred two days later. An electroencephalogram performed on that day was normal. The ACTH therapy was terminated by lowering the dose gradually, and he was given Idantoin 0.1, three times daily, and luminal 0.1, once daily, for ten days. During the following weeks of his hospitalization there were no further attacks.

COMMENT

The occurrence of epileptic attacks in patients suspected of, or suffering from, multiple sclerosis raises important diagnostic problems. The determination of the nature of the convulsions may be difficult because they may be the presenting symptoms of multiple sclerosis a number of years before any other neurological disturbances occur, or are concomitant with them (13). During the clinical course, in addition to convulsions, signs may appear which are indistinguishable from those seen in brain tumors. As these may be accompanied by focal electroencephalographic disturbances (5, 21), temporary increased intracranial pressure and ventricular displacement (10), pneumoencephalography, arteriography and even ventriculography may become necessary. This is

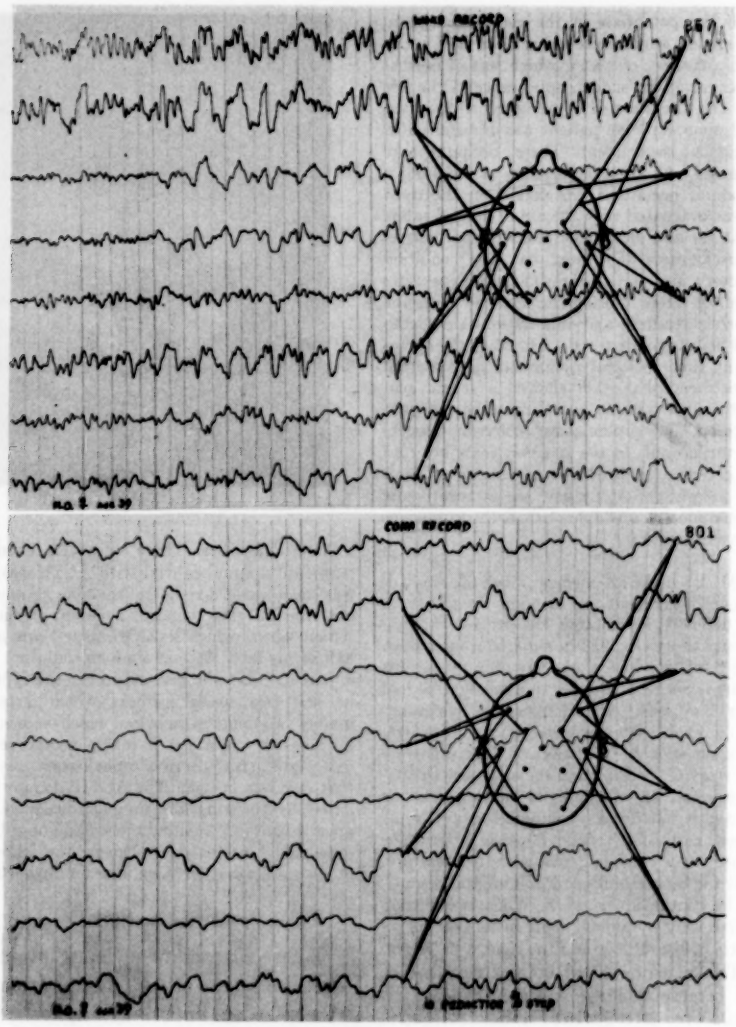

FIG. 3

particularly justified where the diagnosis of multiple sclerosis is doubtful, and because of the possible association of multiple sclerosis and primary or secondary brain tumors (23). The decision to carry out such examinations in these patients is not easy as they may cause a definite deterioration in the clinical course (21) and thus change the immediate prognosis. It seems advisable, therefore, to have if possible an adequate period of observation before these special investigations are undertaken.

The events during the last hospitalization of our second patient are, on the other hand, a good example of the necessity of performing special studies in patients who are known to suffer from multiple sclerosis and in whom a sudden deterioration occurs leading to coma. Though clouding of consciousness progressing to stupor, coma and death have been described in the course of multiple sclerosis (17), it was considered that the present case required urgent ventriculography. In fact the active approach and the emergency neurosurgical intervention in this patient proved to be life saving.

The finding of subdural hematoma could have cast some doubts as to the authenticity of the original diagnosis of multiple sclerosis at the first moment. If the acute and transitory episode five years previously is recalled, however, and the signs and progress of her illness noted, there is no doubt that this patient suffers from multiple sclerosis, and the right Jacksonian fits were only one of its manifestations. In fact the clinical course would indicate that the subdural hematoma existed for a few months at most. The left hemiparesis and the confusion leading to coma developed only a week before the operation and regressed immediately following the evacuation of the right subdural hematoma, leaving the original neurological syndrome.

The occurrence of subdural hematoma in multiple sclerosis seems to be very rare since no mention of it was found in a number of textbooks and monographs on multiple sclerosis. As there is no history of head trauma, this case belongs to the group of spontaneous nontraumatic subdural hematoma, in which the etiologic factors can only rarely be proved (16).

Epileptic attacks in multiple sclerosis are rare. The literature has been shortly reviewed by Müller (13) in 1949, and by Fuglsang-Frederiksen and Thygesen (5) in 1952. Of the twenty-eight cases mentioned by Müller, nineteen had major attacks, and eight had Jacksonian seizures. Of the eight cases recorded by Fuglsang-Frederiksen and Thygesen, three exhibited only simple syncopes or "faints", one had petit mal attacks which later developed into generalized convulsions, two had seizures of urination with complete evacuation of bladder without other symptoms, two had focal motor seizures, and only one had generalized seizures with focal onset which seemed to be approaching status epilepticus.

Among the cases reported in the literature, focal motor seizures have been observed more often than generalized seizures. The occurrence of both on different occasions in the same patient, however, has been described in a number of cases. Usually a paresis appears following the focal motor seizures, as observed in our second case.

Status epilepticus has been reported in very few cases (5); two of our patients, however, suffered from this complication. This event

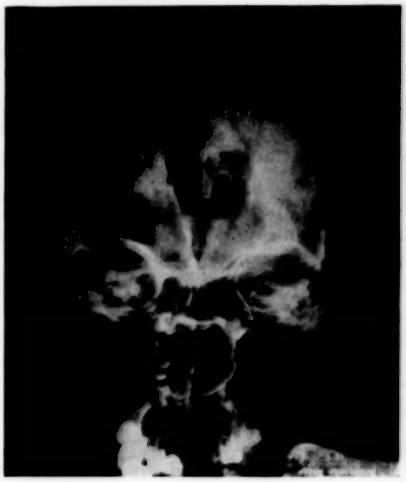

FIG. 4

may be the terminal episode of the disease (12, 13) as happened in our first case. There is no correlation between the age and the onset of the seizures, but from the literature it seems that our first case is one of the youngest reported (8).

The incidence of electroencephalographic abnormalities varies in different series of multiple sclerosis patients (4) reaching up to 80%. This dysrhythmia was diffuse in most cases but showed a focal preponderance in a considerable number of patients. There are very few reports concerned with electroencephalographic studies in patients suffering from multiple sclerosis and convulsions. Six out of the eight patients of Fuglsang-Frederiksen and Thygesen (5) had dysrhythmic records which were severe in three. Two of these patients were psychotic. Williams *et al.* (21), who reported four cases of convulsions in multiple sclerosis, found abnormal records in three with slow activity of focal origin. It should be emphasized, however, that these records were not similar to those observed in idiopathic convulsive disorders. In the case reported by Kass (9), who observed grand mal convulsive seizures as the initial symptom of multiple sclerosis, the electroencephalogram was interpreted as an abnormal, markedly dysrhythmic record compatible with grand mal epilepsy. The record of the patient reported by Hamlin (8), who had most of his seizures focal with loss

of consciousness and perhaps one or two of the grand mal type, was mildly and diffusely abnormal. The electroencephalographic finding reported by Lindstrom (10) in a multiple sclerosis patient, who had a history of some epileptiform attacks but no grand mal seizures with predominantly left-sided disturbances, was that of a pronounced slow wave focus in the right fronto-parietal area. The pneumoencephalogram showed a displacement of the lateral and third ventricles to the left. After three months, when the acute symptoms had subsided, both the ventricular distortion and the electroencephalographic focus disappeared.

There is little in the literature on air studies in multiple sclerosis (10). The cases reported have presented either a normal picture or ventricular dilatation and air pockets in different regions, which are evidence of cortical atrophy. In the few multiple sclerosis patients with convulsions where a pneumoencephalogram was performed, it was found that it was either normal (5, 21) or showed diffuse cerebral atrophy (5, 21) with enlargment of the ventricular system (21). The findings of dilatation of the third ventricle with evidence of internal hydrocephalus (8) and of ventricular displacement (10) have also been reported.

The etiology and the origin of the epileptic seizures with concomitant electroencephalographic changes in multiple sclerosis patients should be sought in the localization of the sclerotic plaques in the different regions of the brain. Though in the cerebrum they are found predominantly in the white central matter, they may also be located in the grey matter of the cortex as well as in the basal ganglia and the periventricular regions (23). There is clinical and experimental evidence that lesions of the diencephalon in the neighborhood of the third ventricle will produce electroencephalographic bilaterally synchronous slow abnormalities with spikes (14). A plaque near the third ventricle adjacent to the diencephalic centers regulating the electrical brain activity could therefore be responsible for the occurrence of generalized epileptic attacks with the typical spike and wave formation in the electroencephalogram, as observed in idiopathic epilepsy (14). This was probably the pathological basis in our first patient who had generalized convulsions. The slight dilatation of the third ventricle would hint towards a pathology in that region. New lesions or gliotic scars located in the cortex or the subcortical areas, on the other hand, can produce generalized convulsions or focal attacks as any other cortical or subcortical lesion may do. The diffuse cortical atrophy and the focal electroencephalographic findings in our second patient, who had right Jacksonian fits, probably point towards this mechanism. The electroencephalographic record during the third hospitalization of this patient was that of coma, and the diminution of electrical potentials observed in the right hemisphere was compatible with that observed on the side of a subdural hematoma (18). The electroencephalographic findings were thus in accordance with the clinical manifestations in these patients. In our third patient the presence of a cortical or a subcortical plaque might be suspected despite the normal electroencephalogram, as it is known that even during short focal seizures the record may be normal unless the electrode placement is exactly over the discharging cortex (18).

Patients suffering from convulsions and multiple sclerosis should be given anti-convulsive drugs in addition to other treatments. In spite of the anti-convulsive therapy given to our first patient, the epileptic attacks continued, leading finally to status epilepticus and death. This could be attributed to the extensive involvement of the central nervous system and the rapid progressive course of the disease (5). On the other hand, the anti-convulsive treatment given to our second patient, where the progress of the disease was rather slow, controlled the seizures quite satisfactorily.

The occurrence of Jacksonian seizures for the first time in our third patient, a few days after the initiation of ACTH therapy, merits special consideration.

ACTH and cortisone are used in the treatment of multiple sclerosis patients, and a beneficial effect has been reported, particularly in cases with recent relapses (1, 3, 7, 15). Though until now relatively large numbers of multiple sclerosis patients have been treated with these hormones, this case seems to be the first to be reported where this complication has occurred during adrenocortical therapy. Our

patient had received similar treatment on three previous occasions. Only during the fourth treatment, however, after a considerable deterioration in his clinical condition had occurred, did he first suffer from a number of attacks of Jacksonian epilepsy.

The relation of epileptic attacks to adrenocortical therapy is of much theoretical and practical interest. These hormones are known to produce epileptic changes in the electroencephalogram (11, 19), and they even cause epileptic attacks in non-neurological patients who have never suffered from this previously (6, 11). In experiments on rats, Woodbury and Sayers (22) have shown that cortisone, and to some extent ACTH, produced a reduction in electroshock seizure thresholds, suggesting an increased brain excitability. Torda and Wolff (20) found that a single injection or a series of injections of ACTH given in a few minutes will cause an increase in voltage, sporadic spiking and paroxysmal runs of low-frequency high voltage waves in the electrical brain activity of rats, as well as an increased sensitivity to convulsion-inducing agents. The effect of ACTH on the nervous structures was probably a direct one, as these changes occurred very quickly following the ACTH injection and also in hypophysectomized and adrenalectomized animals.

It can thus be assumed that by lowering the convulsive threshold in the severely damaged nervous system of our patient, the ACTH was responsible for the occurrence of these epileptic attacks. As phenobarbital or diphenylhydantoin is able to prevent the brain hyperexcitability induced by cortisone in experimental animals (2), it seemed proper to give anti-convulsive therapy and to discontinue the adrenocortical therapy gradually, as an abrupt cessation might cause adrenocortical insufficiency. Such a procedure in our patient stopped the attacks, and they did not recur in spite of the fact that no anti-convulsive therapy was given.

Summary

Three patients suffering from multiple sclerosis and epilepsy were reported. One of them had attacks of generalized epilepsy and died following a status epilepticus, while the other two had Jacksonian attacks. One of these cases lapsed into coma due to a subdural hematoma, and an emergency neurosurgical intervention proved to be life saving. In the other patient the attacks occurred for the first time while receiving ACTH therapy.

The clinical problems which may arise with the occurrence of epileptic attacks in multiple sclerosis patients are discussed. The recent literature on epileptic seizures in multiple sclerosis and the electroencephalographic and pneumoencephalographic findings in these patients are reviewed, and the pathogenesis of these attacks mentioned.

The role played by adrenocortical therapy in precipitating epileptic attacks is emphasized, and anti-convulsive therapy is suggested for patients in whom multiple sclerosis is complicated by convulsions.

BIBLIOGRAPHY

1. Feldman, S., and Kidron, D. P.: Experiences with ACTH and cortisone in organic diseases of the nervous system. *Month. Rev. Psychiat. & Neurol., 132:* 96, 1956.
2. Fingl, E., Olsen, L. J., Harding, B. W., Cockett, A. T., and Goodman, L. S.: Effects of chronic anticonvulsant administration upon cortisone-induced brain hyperexcitability. *J. Pharmacol. & Exper. Therap., 105:* 37, 1952.
3. Fog, T.: Some experiences with ACTH treatment in disseminated sclerosis. *Acta endocrinol., 9:* 213, 1952.
4. Fuglsang-Frederiksen, V., and Thygesen, P.: The electroencephalogram in multiple sclerosis. *Arch. Neurol. & Psychiat., 66:* 504, 1951.
5. Fuglsang-Frederiksen, V., and Thygesen, P.: Seizures and psychopathology in multiple sclerosis. An electroencephalographic study. Discussion of pathogenesis. *Acta psychiat. et neurol. scandinav., 27:* 17, 1952.
6. Geppert, L. J., Dietrick, A. C., Johnston, E. H., and Lind, C. J.: Fatal convulsive seizures associated with cortisone therapy. *Am. J. Dis. Child., 84:* 416, 1952.
7. Glaser, G. H., and Merritt, H. H.: Effects of corticotropin (ACTH) and cortisone on disorders of the nervous system. *J. A. M. A., 148:* 898, 1952.
8. Hamlin, P. G.: Convulsive states and multiple sclerosis: Report of a case. *Ann. Int. Med., 42:* 201, 1955.
9. Kass, M.: Multiple sclerosis with acute onset. Report of a case. *U. S. Armed Forces M. J., 5:* 115, 1954.
10. Lindstrom, P. A.: Ventricular displacement and electroencephalographic focus in multiple sclerosis. *Arch. Neurol. & Psychiat., 70:* 254, 1953.
11. Loewenberg-Wayne, H. J.: Convulsive seizures complicating cortisone and ACTH therapy: Clinical and electroencephalographic observations. *J. Clin. Endocrinol., 14:* 1039, 1954.
12. McAlpine, D., and Compston, N.: Some aspects of the natural history of disseminated sclerosis. *Quart. J. Med., 21:* 135, 1952.

13. Müller. R.: Studies on disseminated sclerosis. *Acta med. scandinav., Suppl. 222, 131:* 1, 1949
14. Ostow, M., and Strauss, H.: The significance of bilateral abnormality in the electroencephalogram. *J. Mt. Sinai Hosp., 20:* 173, 1953.
15. Reis, G., Sahlgren, E., and Jönsson, B.: ACTH and cortisone in the treatment of multiple sclerosis. *Acta psychiat. et neurol. scandinav., 28:* 429, 1953.
16. Scott, M.: Spontaneous nontraumatic subdural haematoma. *J. A. M. A., 141:* 596, 1949.
17. Schumacher, G. A.: Multiple sclerosis. *J. A. M. A., 143:* 1059, 1950.
18. Schwab, R. S.: *Electroencephalography in Clinical Practice.* Philadelphia & London: W. B. Saunders Co., 1951.
19. Streifler, M., and Feldman, S.: On the effect of cortisone on the electroencephalogram. *Confinia. neurol., 13:* 15, 1953.
20. Torda, C., and Wolff, H. G.: Effects of various concentrations of adrenocorticotrophic hormone on electrical activity of brain and on sensitivity to convulsion-inducing agents. *Am. J. Physiol., 168:* 406, 1952.
21. Williams, G. H., Nosik, W. A., and Hunter, J. A.: Convulsions as manifestation of multiple sclerosis. *J. A. M. A., 150:* 990, 1952.
22. Woodbury, D. M., and Sayers, G.: Effect of adrenocorticotrophic hormone, cortisone and desoxycorticosterone on brain excitability. *Proc. Soc. Exper. Biol. & Med., 75:* 398, 1950.
23. Zimmerman, H. M., and Netsky, M. G.: The pathology of multiple sclerosis. *A. Res. Nerv. & Ment. Dis. Proc., 28:* 271, 1950.

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IMPAIRMENT OF ABSTRACTING ABILITY IN MULTIPLE SCLEROSIS[1]

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Intellectual impairment in multiple sclerosis (M.S.) has been reported at both the clinical and experimental levels. While the clinical reports vary considerably as to the percentage of M.S. patients manifesting intellectual changes (11), controlled studies utilizing psychological tests have demonstrated significant decrements in mental abilities (1, 2). Further, Ross and Reitan (11), utilizing M.S., organic, and control patients, have reported a remarkable similarity between M.S. and organic patients' performance on the Halstead battery, suggesting that lesions of both white and grey matter may produce the same behavioral effects of impairment.

Perhaps the most conclusive evidence for intellectual changes in M.S. comes from the work of Canter (2). Using the test-re-test method this investigator demonstrated a significant decrement on the Army General Classification Test in M.S. patients compared with controls over a 4-year period. He also found a relative decrement in the Wechsler-Bellevue Intelligence Test scores over a 6-month period. Canter elsewhere (7, p. 9) states that: "The most striking psychological loss is inability to analyze and synthesize abstract problems." Canter appears to have based this statement on "indirect measures" of organic deficit such as the Shipley-Hartford, the Wechsler Deterioration Index, and the fact that the M.S. patients manifested a decrement in their re-test performance on the Block-Design Subtest of the Wechsler-Bellevue. It would appear that a more direct test of his hypothesis could be made with a test devised specifically to measure loss of the abstract attitude. The Grassi Block Substitution Test (5) is such a device.

Utilizing Goldstein's principles (4), Grassi specifically designed his test to reveal minimal as well as severe loss of abstract ability. The test requires that the subject shift his set several times at both a simple and complex level during a series of duplications of block designs. Grassi was able to distinguish organics, functional disturbances, and control subjects at a high level of significance on the basis of their block-substitution scores (5). While other studies utilizing his test have not discriminated between organics and controls as effectively, they have substantiated Grassi's claim that intellectual impairment associated with organicity can be detected with his test (6, 10).

The aim of the present experiment is to compare the performance of patients with M.S. and patients with no C.N.S. disorder on the Grassi Block Substitution Test. It is predicted that the M.S. patients will score significantly poorer on this test than the control patients with whom they are matched on the variables of age, education, intelligence, race, and sex.

SUBJECTS

The M.S. group consisted of 14 males and 3 females who were patients at the V.A. Hospital or Duke University Hospital in Durham, North Carolina. Only patients of whom there was no doubt as to diagnosis were used. The range of the duration of the disease was from 1 to 14 years with a mean of 7.7 years. The Bronx Scale (8) ratings of functional disability ranged from 2, minimal impairment, to 7, severe impairment, with a mean of 4.5.[3]

The control group consisted of 14 male and 3 female patients drawn from the general medical and surgical wards of both hospitals. Only patients who had no evidence of C.N.S. disorder were utilized. The closeness of the matching procedure is demonstrated by the data presented in table 1. None of the differences between means or standard devia-

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TABLE 1.—AGE, EDUCATION, AND VERBAL I.Q. FOR M.S. AND CONTROL GROUPS

Group	Age	Education	Verbal I.Q.
Control (N = 17)			
$\bar{x}$	32.59	9.44	97.59
S.D.	5.70	3.91	17.92
M.S. (N = 17)			
$\bar{x}$	32.59	10.35	96.53
S.D.	7.15	3.64	17.95

None of these differences approach significance as measured by the "t" test (3).

TABLE 2.—STEPS AND LEVELS IN THE GRASSI BLOCK SUBSTITUTION TEST

Step	Level	Task for Subject
1	simple concrete	to copy the top of the four stimulus blocks using the same color and design
2	simple abstract	to copy the design on the top by using different colors
3	complex concrete	to copy the top and the sides using the same colors and same design
4	complex abstract	to copy the design on top and sides using different colors

tions is near significance. There were 6 Negro subjects in the M.S. group and 7 in the control group.

PROCEDURE

All subjects were tested first on the six subtests of the Verbal Scale of the Wechsler-Bellevue Intelligence Scale I (12). The Verbal Scale was chosen because it has been found to be less susceptible to the effects of brain damage (9), and the effect of motor difficulty which is often present in M.S. patients would be minimized. Thirteen of the M.S. group and 14 of the control were also given four subtests from the Performance Scale of the Wechsler-Bellevue. The Block-Design Subtest was not included.

Following the administration of the intelligence test, the Grassi Block Substitution Test (G.B.S.T.) was administered. This test requires the subject to copy five designs of varying difficulty by utilizing four colored blocks. Table 2 presents the various steps or levels, ranging from the simple concrete to the complex abstract, and the tasks posed for the subject. Each subject was given a demonstration of all four steps before testing in order to make sure that he *thoroughly* understood what he was to do in each step. At least five minutes were allowed for each step in the test proper although Grassi states that a 3-minute time limit is satisfactory. The former was employed because it was felt that the M.S. group might be unduly penalized by motor or sensory difficulties.

Scoring of the G.B.S.T. was done according to Grassi's rules. One point was awarded for each step of each design which was correctly reproduced—a total of 20 possible points. Time credits of ½ point were given for time differences of 10 seconds or less (i.e., a better performance) between steps. Time deductions of ½ point were made for any step requiring more than 120 seconds to complete. The maximum score is 30 points. Grassi states that subjects with no intellectual deterioration due to brain damage should score in the range of 20–30 points, subjects with moderate deterioration between 16 and 20, and subjects with severe deterioration 16 and below (5, p. 30).

RESULTS

The results indicate that the M.S. group scores significantly lower than the control group on the Grassi Test (table 3). The mean score for the former falls within the range of "moderately deteriorated" as defined by Grassi while the controls fall in the "non-deteriorated" range. Despite the fact that the difference between means is highly significant, overlap exists as indicated by the standard

TABLE 3.—SCORING ON THE G.B.S.T. BY THE CONTROL AND M.S. GROUPS

Group	Grassi Score*
Control (N = 17)	
$\bar{x}$	21.59
S.D.	3.42
M.S. (N = 17)	
$\bar{x}$	18.32
S.D.	2.79

*A "t" test for differences between the means resulted in a "t" of 3.06, $p < .005$.

deviations and the data in table 4. Two of the control group fall in the "moderately deteriorated" range and two subjects fall in the "severely deteriorated" category. On the other hand, five M.S. subjects fall in the "non-deteriorated" category.

While verbal intelligence was closely matched in this study, the Performance Scale I.Q.'s were not. The Performance Scale, however, might be a better control since it is comprised of subtests involving perceptual-motor skills in which rapidity of performance is a factor as in the G.B.S.T. The available performance I.Q.'s on 14 control ($\bar{x}$ = 99.29) and 13 M.S. ($\bar{x}$ = 89.62) subjects indicated a difference of 9.67 I.Q. points in favor of the controls. While this difference is not significant (t = 1.72), it was decided that a test of differences in G.B.S.T. scoring between a group of M.S. patients and controls matched for Performance I.Q. might provide a more conclusive test of prediction. It was possible to match 9 M.S. patients ($\bar{x}$ I.Q. = 95.67) with 9 controls ($\bar{x}$ I.Q. = 95.78). Table 5 presents the results: the M.S. subjects have significantly poorer G.B.S.T. scores (t = 3.18, $p < .01$).

Further evidence that the lower level of performance on the G.B.S.T. is a result of an impaired abstracting ability is found in the breakdown of component scores and steps on the Grassi. In table 6 the accuracy scores, time credits, and time deductions are compared for the two groups. The only significant difference found is in the accuracy scores, i.e., whether a subject got the designs correct or not was more important than time

TABLE 4.—Placement of M.S. and Control Subjects According to Grassi's Classification

Group	No Deterioration (20–30)	Moderate Deterioration (16–19)	Severe Deterioration (0–16)
M.S.	5	7	5
Control	13	2	2

TABLE 5.—Scoring on the G.B.S.T. by the Groups Matched for Performance I.Q.

Group	Grassi Score*
Control (N = 9)	
$\bar{x}$	22.22
S.D.	1.99
M.S. (N = 9)	
$\bar{x}$	19.17
S.D.	2.08

* A "t" of 3.18, $p < .01$, is found for the difference between the means.

TABLE 6.—Breakdown of the Total G.B.S.T. Score

Group	Accuracy Score*	Time Credits	Time Deductions
Control (N = 17)			
$\bar{x}$	18.88	3.29	.59
S.D.	2.12	1.57	.44
M.S. (N = 17)			
$\bar{x}$	16.35	2.47	.53
S.D.	1.93	.98	.69

* The "t" of 3.63 ($p < .005$) between the mean accuracy scores is the only significant "t" in this table.

TABLE 7.—Number of Subjects Missing Concrete and Abstract Steps in the Two Groups

Group	Concrete Steps*		Abstract Steps†	
	Missed none	Missed one or more	Missed none	Missed one or more
Controls (N = 17)	17 (100%)	0	12 (70%)	5
M.S. (N = 17)	11 (65%)	6	1 (5%)	16

* A test for significance between percentages (3) of controls and M.S. missing no steps at the concrete level gives a "z" of 1.86, p = .06.

† The percentage of controls missing no abstract steps is significantly higher than the percentage of M.S. subjects ("z" = 3.52, $p < .001$) who miss no abstract steps.

TABLE 8.—Number of Correct Solutions on the G.B.S.T. Obtained by High and Low Bronx Scale Groups

Group	Number of Correct Solutions on G.B.S.T.*
Bronx Scale 4 and below (N = 9)	
$\bar{x}$	17.22
S.D.	1.79
Bronx Scale 5 and above (N = 8)	
$\bar{x}$	15.38
S.D.	1.69

* A "t" of 2.15, $p < .05$, for difference between means is found.

bonuses or debits. In table 7 the number of subjects in each group missing concrete and abstract steps is compared. None of the control subjects failed the concrete steps while six of the M.S. group did. This difference does not quite reach statistical significance. However, the two groups differ considerably on the abstract steps. Sixteen out of 17 M.S. patients failed one of the more in comparison to 5 out of 17 controls, a highly significant difference ($p < .001$).

Discussion

These results suggest that a moderate degree of impairment of abstract ability exists in the group of M.S. patients compared with closely matched controls. It should be noted immediately, however, that some M.S. patients (almost one-third) of the group show no impairment. This finding is consistent with that of Baldwin (1) who noted that deterioration may or may not occur in M.S. and, if present, may be severe or slight. On the other hand, the poor performance manifested by over two-thirds of the group is in accord with the findings of impaired intellectual functioning noted by Ross and Reitan (11) and Canter (2) in their studies of multiple sclerosis. In particular Canter's suggestion that the ability to analyze and synthesize abstract problems is affected in M.S receives striking confirmation. This difference in abstracting ability remains significant even when visual-motor and performance ability are controlled.

An attempt was made to test whether ratings on the Bronx Scale of functional disability in M.S. were related to scoring on the G.B.S.T. The assumption was made here that the more disabled M.S. patients would be more likely to have diffuse lesions and consequently greater cortical interference. Thus, it would be predicted that patients scoring higher on the Bronx Scale would manifest poorer performance on the G.B.S.T. Since motor disability is significantly different in these two groups by definition, it would appear that only the correctness or incorrectness of solution should be utilized. The results are presented in table 8. Patients with Bronx Scale ratings of 4 and below have an average 17.22 correct solutions out of the possible 20, while patients with ratings of 5 and above average 15.38. The "t" test for difference between these means is significant ($t = 2.15$, $p < .05$). This finding is also in accord with Canter's report that intellectual impairment in M.S. roughly parallels severity of neurological disturbance (2).

Finally, it should be noted that intelligence measured by the Wechsler-Bellevue appears to be an important factor in G.B.S.T. performance. For example, the M.S. patients falling in the "severely deteriorated" category had an average Verbal Scale I.Q. of 81.4 compared with 108.0 for "no deterioration" patients. Control subjects who fell in the "severe and moderate deterioration" groups had a mean Verbal Scale I.Q. of 74.5 compared with the 104.7 of the "no deterioration" group. It is evident that Grassi's statement that intelligence must always be considered when the test is being used clinically (5, p. 26) should be taken seriously.

Summary

In view of experimental and clinical findings it is predicted that patients with multiple sclerosis will manifest a loss in the ability to function at the abstract level. Seventeen M.S. patients, 14 males and 3 females, are closely matched with 17 control patients having no C.N.S. disorder on age, sex, education, intelligence, and race. Both groups are given the Wechsler-Bellevue Intelligence Scale, Form I, and the Grassi Block Substitution Test, the latter requiring different levels of functioning on the abstract-concrete continuum. The results confirm the prediction: the M.S. patients perform significantly poorer on the G.B.S.T., especially on the abstract levels. Additional analysis controlling for the possible interfering effects of visual-motor difficulty in M.S. gives rise to the same results. It is concluded that a moderate loss of the ability to abstract in patients with multiple sclerosis is demonstrated and that such a loss roughly parallels extent of neurological disturbance.

The authors wish to acknowledge the valuable aid of Dr. Albert Heyman and Dr. Joseph C. Parker from the Neurology and Psychiatry Services, respectively, of Duke University School of Medicine and the Durham V.A. Hospital, and Dr. George T. Lodge, Psychology Section, Dept. Psychiatry, Durham V.A. Hospital.

BIBLIOGRAPHY

1. Baldwin, M. J.: A clinico-experimental investigation into the psychological aspects of multiple sclerosis. *J. Nerv. & Ment. Dis., 115:* 299, 1952.
2. Canter, A. H.: Direct and indirect measures of psychological deficit in multiple sclerosis. *J. Gen. Psychol., 44:* 27, 1951.
3. Edwards, A. E.: *Experimental Design in Psychological Research.* New York: Rinehart and Company, 1950.
4. Goldstein, K., and Scheerer, M.: Abstract and concrete behavior. *Psychol. Monogr., 53:* 239, 1941.
5. Grassi, J. R.: *The Grassi Block Substitution Test for Measuring Organic Brain Pathology.* Springfield, Illinois: Charles C Thomas, 1953.
6. Harris, P.: Validity of the Grassi-Fairfield Block Substitution Test in differential diagnosis. *J. Consult. Psychol., 19:* 330, 1955.
7. Harrower, M. R.: *Psychological Factors in the Care of Patients with Multiple Sclerosis.* New York: National Multiple Sclerosis Society, 1953.
8. Kurtzke, J. F.: A new scale for evaluating disability in multiple sclerosis. *Neurology, 5:* 580, 1955.
9. Morrow, R. S., and Mark, J. C.: The correlation of intelligence and neurological findings on twenty-two patients autopsied for brain damage. *J. Consult. Psychol., 19:* 283, 1955.
10. Ptacek, J. E., and Young, F. M.: Comparison of the Grassi Block Substitution Test with the Wechsler-Bellevue in the diagnosis of organic brain damage. *J. Clin. Psychol., 10:* 375, 1954.
11. Ross, A. T., and Reitan, R. M.: Intellectual and affective functions in multiple sclerosis. *Arch. Neurol. & Psychiat., 73:* 663, 1955.
12. Wechsler, D.: *Measurement of Adult Intelligence* Baltimore: The Williams & Wilkins Company, 1944.

SCHIZOPHRENIA AND CORTICAL INVOLVEMENT[1]

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Within the past few years there has been an increasing proportion of studies in schizophrenia which emphasize constitutional, organic or genetic factors in the etiology of and/or in the course of the disease (1, 3, 4, 8, 11). It may be that much of the controversy over heredity versus environment or somatogenic versus psychogenic causes of schizophrenia may be lessened if not resolved by a reevaluation of the disease entity itself.

There are many who believe that the label "schizophrenia" encompasses more than one disease process. Kantor *et al.* (9) have recently indicated that schizophrenia may be differentiated into two distinct entities: process schizophrenia and reactive schizophrenia. Both conditions may be manifested by delusions, hallucinations, loss of contact with reality and other psychotic symptomatology, and both may be subcategorized "catatonic," "paranoid," etc. Furthermore, both illnesses may range from mild to severe in degree of disturbance and incapacitation. The distinction is made on the basis of analysis of past history material. The schizophrenic patient with an early insidious onset is classified as a process schizophrenic and is felt to have a very poor prognosis, while the patient whose early development was more adequate and whose breakdown seemed precipitated by environmental stress is called reactive, and considered to have a more favorable prognosis.

It has long been noted that a marked similarity in psychodiagnostic test performances exists between schizophrenic patients and individuals suffering from organic brain damage. Recently a study was reported by Brackbill and Fine (2) which explicitly tested the hypothesis that Rorschach records of organics and of process schizophrenics do not differ in respect to Piotrowski's signs of organic involvement and that reactive schizophrenics do differ significantly in this respect from organic patients and process schizophrenics. Their investigation supported these hypotheses, and the authors suggested that some of the apparent inconsistent findings in studies investigating schizophrenia may be a function of failing to recognize what they describe as the typical schizophrenic reaction (reactive type) from the atypical (or process) type. No attempt was made, however, to relate their findings to prognosis.

The present author has previously reported a new psychological test for detecting the effects of cortical involvement, the Hooper Visual Organization Test (12). Although the test is described more fully elsewhere (5, 6), it can be briefly summarized here as a procedure for measuring the tendency to be stimulus bound. The test consists of a number of drawings of common objects, each of which is divided into two or more sections. S must recognize what the object is by visual organization processes alone. On many items, single parts of the drawing show fairly close resemblance to common familiar objects unrelated to the correct Gestalt. For example, Item 24 is a drawing of a mouse. That part of the drawing depicting the rear quarters and tail bears a rather close resemblance to a pipe used for smoking. If S replies "pipe" to the item, he demonstrates an inability to integrate the disparate parts of the whole. Such responses were originally classified by Hooper as "concrete". More recently he has referred to such concepts as "part responses" (6). The present author suggests the term "isolate" as a more descriptive label for this type of response. The scoring of "part responses", or "isolates", was originally developed on an empirical basis. However, there does seem to be a rationale to account for the deviant Hooper performance. It would appear that the test gets at the "... characteristic distractibility which ... interferes with (the brain damaged individual's) capacity to recognize wholes if the constituent parts ... show any distracting detail" (7).

As part of routine psychological testing on a continued treatment service in a 1,000 bed psychiatric hospital, the Hooper Visual Organi-

[1] Psychiatric Evaluation Project, Veterans Administration Hospital, Brockton, Massachusetts.

TABLE 1.—DISTRIBUTION OF SCHIZOPHRENIC SUB ATEGORIES

Subcategory	Number of Cases
Paranoid	16
Catatonic	8
Undifferentiated	4
Simple	3
Hebephrenic	1
Schizo-affective	1
Total	33

zation Test was administered by the author to a number of schizophrenic patients. It was noted that many of the patients carrying a diagnosis of schizophrenia, but not diagnosed as brain damaged, performed on the Hooper test in a way characteristic of individuals suspected of cortical involvement.

Over a period of several months the patients were periodically reviewed for treatment and discharge planning by the psychiatric team. A relationship was noted between approval for discharge and Hooper performance. That is, patients leaving the hospital tended to be considered free from cortical involvement as measured by the Hooper test, and conversely, patients remaining for continued treatment tended to be categorized brain damaged on the basis of Hooper performance. It was decided to follow these patients one year after the test data had been collected to test the hypothesis that performance on the Hooper test is related to prognosis.

PROCEDURE

The population studied consisted of 33 male patients ranging in age from 23 to 65, median age = 35.0, with an established diagnosis of chronic schizophrenia (see table 1), who were administered the Hooper test while on a continued treatment service.

A research clerk[2] was instructed in the scoring procedure used with the revised Hooper Visual Organization Test and scored all 33 protocols. The records bore no identifying data other than code number. Patients were classified as *free from cortical involvement* (N = 19) when their performance on the Hooper was within normal limits, or as *cortical involvement suspected* (N = 14) when their performance was deviant as defined in the previously mentioned study (12).

One year after the test data had been collected, the status of each patient was obtained from the hospital registrar. No definition of "recovery" or "cure" was attempted. Instead, a single criterion for classification was used. If the patient's improvement or condition was such that by the follow-up date he had been released from the hospital, whether on Maximum Hospital Benefit or Trial Visit status, he was classified *favorable prognosis* (N = 19). If, on the other hand, he still remained in the hospital, he was categorized *unfavorable prognosis* (N = 14).

RESULTS

All data were analyzed by use of fourfold contingency tables, dichotomizing from the medians. Because of the relatively small N's involved, estimates of significance were obtained through Mainland's tables (10) where probabilities are equivalent to computation by Fischer's exact test. All probabilities reported are for two-tailed tests of the null hypothesis

TABLE 2.—COMPARISON BETWEEN HOOPER PERFORMANCE AND AGE, EDUCATION, DIAGNOSTIC SUBCATEGORY AND PHASE OF HOSPITALIZATION WHEN TESTED (N = 33)

Variables Compared	p*	Level of Significance
Hooper performance with age	.500	—
Hooper performance with educational level	.500	—
Hooper performance with diagnostic subcategory†	.330	—
Hooper performance with phase of hospitalization when tested‡	.257	—

* From Mainland (10).
† Paranoid type (N = 16) vs other types (N = 17).
‡ Used as estimate of severity of symptoms.

TABLE 3.—COMPARISON BETWEEN HOOPER PERFORMANCE AND PROGNOSIS (N = 33)

Variables Compared	p*	Level of Significance
Hooper performance with prognosis	.017	.02

* From Mainland (10).

[2] The author wishes to express his appreciation to Mrs. Marie Goodwin for her cooperation in this phase of the study.

and hence are considered conservative estimates of significance.

As previously indicated, the selection of patients was essentially random so that it was felt that such variables as age, education, severity of symptoms, etc., would not differ significantly between the two groups. Nevertheless, comparisons of these factors with Hooper performance were made.

Although no direct evidence of severity of symptoms in the two groups was obtained, the fact that more deviant psychotic symptomatology is commonly manifested in the early period of hospitalization rather than in the late phase was used to obtain an estimate of severity of symptoms. That is, patients administered the Hooper early in their hospitalization were arbitrarily categorized as the more severe symptomatic group (N = 18) while those who were tested in the late phase of their hospitalization were considered the less severe symptomatic group (N = 15).[3]

Comparisons between the two groups in respect to age, education, diagnostic subcategory and phase of hospitalization when tested (used as an index of severity of symptoms) all fall far short of significance (see table 2), indicating that the two groups are approximately equivalent in regard to these variables.

The comparison between Hooper performance and hospital status one year after test evaluation is significant, p = .017 (see table 3) and supports the hypothesis that Hooper performance is related to prognosis.

These findings suggest that conflicting evidence of organic factors in "schizophrenia" may be a function of the inclusion of two separate disease entities, or two qualitatively different phases of a disease process, under one diagnostic label. Use of qualifiers such as *functional* or *reactive* as opposed to *constitutional* or *process* might prove worthwhile not only in the diagnosis and treatment planning of "schizophrenia" but also in the design of research investigations in this area of mental illness.

[3] Admittedly this is a crude measure of severity of symptoms. However, it should be pointed out that all S in this study were patients on a so-called "quiet" continued treatment service at the time of testing. For this reason alone it appears likely that the two groups were fairly homogeneous in regard to severity of symptoms.

Summary

Thirty-three chronic schizophrenic patients, hospitalized on a continued treatment service at the time of evaluation, were divided into two groups, *free from cortical involvement* or *cortical involvement suspected*, on the basis of their performance on the revised Hooper Visual Organization Test, a psychological test designed to detect the effects of brain damage. There were no significant differences between the two groups in respect to age, education, diagnostic subcategory and phase of hospitalization when tested (used as an index of severity of symptoms).

The hypothesis that Hooper performance is related to prognosis, as determined by hospital status one year after initial evaluation, was supported by the data. The notion that schizophrenia is not a unitary disease entity tends to be corroborated by these findings.

BIBLIOGRAPHY

1. Abramson, H. A., Jarvik, M. E., Gorin, M. H., and Hirsch, M. W.: Lysergic acid diethylamide (LSD-25): XVII. Tolerance development and its relationship to a theory of psychosis. *J. Psychol.*, 41: 81–105, 1956.
2. Brackbill, G. A., and Fine, H. J.: Schizophrenia and central nervous system pathology. *J. Abnorm. & Social Psychol., 52:* 310–313, 1956.
3. Heath, R. G.: *Studies in Schizophrenia.* Harvard Univ., 1954.
4. Hoffer, A., Osmond, H., and Smythies, J.: Schizophrenia: a new approach. *J. Ment. Sc., 100:* 29–45, 1954.
5. Hooper, E. H.: The So. Cal. visual organization test. Unpublished master's thesis, Univ. Southern Calif., 1947.
6. Hooper, E. H.: *Hooper Visual Organization Test.* (Manual) Manhattan Beach, Calif.: Psychological Service Center, 1955.
7. Jenkins, R. L. The thalamo-cortical circulation of neural impulse. *J. Nerv. & Ment. Dis., 120:* 343–348, 1954.
8. Kallman, F. J.: *Heredity in Health and Mental Disorder.* New York: W. W. Norton & Co., 1953.
9. Kantor, R. E., Wallner, J. M., and Winder, C. L.: Process and reactive schizophrenia. *J. Consult. Psychol., 17:* 157–162, 1954.
10. Mainland, D., Herrera, L., and Sutcliffe, M. I.: *Tables for Use with Binomial Samples.* (Manual) N. Y. Univ. Coll. of Med., 1956.
11. Planansky, K.: Heredity in schizophrenia. *J. Nerv. & Ment. Dis., 122:* 121–141, 1955.
12. Walker, R. G.: The revised Hooper visual organization test as a measure of brain damage. *J. Clin. Psychol., 12:* 387–388, 1956.

THE POTENTIATING EFFECT OF DIPHENHYDRAMINE HYDROCHLORIDE (BENADRYL)

SAMUEL ROSNER, M.D., F.I.C.S.

Diphenhydramine hydrochloride (Benadryl)[1] has been used in many neurologic conditions with some benefit to the patients. This substance is a white, crystalline, water soluble powder with pronounced antihistaminic properties. The purpose of this article is to demonstrate the clinical value of Benadryl as a potentiating agent with novocaine in the following conditions: 1) Headache of all types except intracranial pressure syndrome, intracranial bleeding and endocrine headache. 2) Herniated discs. 3) Neuralgia. 4) Meniere's syndrome with tinnitus aureum.

In addition, I have used it with barbiturates as pre-operative medication. I have found that diphenhydramine hydrochloride acts as a potentiating agent when combined with novocaine. What follows is the result of my observations in the use of diphenhydramine hydrochloride with novocaine administered intravenously or intramuscularly.

Headaches. Migraine headaches, histamine headaches, temporal arteritis, tension headaches and post-traumatic headaches are relieved within minutes after the administration of 30 mg. of Benadryl combined with 10 cc. of 1 per cent novocaine without ephedrine. This combination is given intravenously, taking a full minute to inject. The patient will be somewhat dizzy. I have found that the results are better if the patient does get somewhat dizzy after the injection. This can be done as an office procedure. The patient is asked to rest for about fifteen minutes after the injection. In histamine headache, the flush will disappear within two minutes of administration of the injection.

In temporal arteritis, the combination of 20 mg. of Benadryl and 5 cc. of 1 per cent novocaine can be injected about one inch above the condyle of the mandible on the painful side. This will result in complete relief within minutes in the majority of cases.

The injections whether intramuscular or intravenous will, in most cases, have to be repeated every 24 or 48 hours for a number of times. Four injections will usually terminate an attack of headache that may have lasted for weeks or months. If there is no relief after six injections, then none can be expected with this method. Once relief is obtained, it may be months or years before there is a recurrence. Endocrine headaches are not often relieved by this method.

Post-traumatic headaches, especially after serious head injury, are best treated in hospital by the following methods:

Thirty mg. of Benadryl in combination with 500 cc. of 1/10 per cent Procaine in normal saline with soluble vitamin B and vitamin C added. This infusion is run into the vein in 60 to 90 minutes and is given daily for 10 days.

This combination will also give great relief to patients with headache after pneumoencephalography or spinal puncture. The infusion should be given twice daily for two days.

The tension headaches will respond to intravenous Benadryl and novocaine as has been described as an office procedure. In addition, Elix. Phenobarbital 3 ss, with Elix. Vitamin B complex ad 3 ℥, should be prescribed; 3 ℥ to be taken q.i.d.

The foregoing procedures have been used in 75 cases of various types of headache with uniformly good results. The only exceptions being endocrine headaches and headaches caused by intracranial tension, such as, intracranial neoplasm or hemorrhage.

Herniated discs. In the painful states associated with herniated intervertebral discs, Benadryl and procaine given in 500 cc. normal saline as described under traumatic headache will be a potent method of relief. The infusion should be given intravenously daily for 10 days and should run in within 90 minutes. In addition, traction should be used intermittently daily for 10 days. Analgesics should be given as needed.

As an office procedure, 30 mg. of Benadryl in combination with 10 cc. of 1 per cent novo-

[1] Supply donated by Parke, Davis, & Co.

caine without ephedrine can be used. In herniated discs, an ordinary intramuscular needle is inserted on the most painful site one inch lateral to the spinous process of the disc involved. The site in the cervical region is usually between the fifth and sixth vertebrae. In the lumbar region, the site is usually between the fifth lumbar and first sacral vertebrae. Injections given at 48-hour intervals for four to six injections will give relief in 80 per cent of cases. Analgesics and the usual orthopedic care should be given. In patients who have no contraindication to the use of steroids, prednisone in combination with buffered acetylsalicylic acid can be given four times daily for one week along with the course of injections.

Neuralgia. Benadryl in combination with 1 per cent novocaine without ephedrine has been used with success in two cases of trigeminal neuralgia. One patient, an elderly man, had undergone craniotomy at another hospital for trigeminal neuralgia. After two years the pain returned and was confined to the maxillary and mandibular branches, which were supposed to have been sectioned. Novocaine and alcohol resulted in temporary relief which lasted about one week. Injection of the mandibular and maxillary branches was carried out extracranially at the foramina of the skull. A solution of 50 mg. of Benadryl and 10 cc. of 1 per cent novocaine without ephedrine was used for both nerves. This injection was repeated one week later. The patient has been free of pain for more than eight months. The second case of trigeminal neuralgia is an elderly woman who had had recurrent attacks involving the right maxillary and mandibular divisions of the trigeminal nerve. Novocaine and alcohol block carried out about two years ago resulted in relief until a few weeks ago. Within the past three weeks novocaine and alcohol blocks were carried out on two occasions with only temporary relief of pain. This week, novocaine and Benadryl as described in the first case were injected with total relief of pain. It is too soon to know whether relief will last for a prolonged period.

It should be noted that the novocaine and Benadryl were injected extracranially in both cases. The numbness wears off almost completely within a few days after the injection. The relief in the first patient still persists.

In a case of ulnar nerve neuralgia due to trauma, the patient was suffering from severe pain following an accident. At operation, the ulnar nerve was found to be caught in scar tissue. The scar tissue was removed, and the nerve was freed on two occasions. Nevertheless, pain and paresthesia persist despite local novocaine blocks, novocaine and histamine blocks locally and paravertebrally, and stellate novocaine blocks. However, 20 mg of Benadryl and 10 cc. of 1 per cent novocaine without ephedrine injected 2 cm. above the medial epicondyle result in temporary relief of pain which lasts longer by six to twelve hours than any other method.

A case of causalgia in a mid-humerus amputation stump responded well to injection into the brachial plexus at the level of the first rib. This patient had been having constant, excruciating pain which was relieved by stellate ganglionectomy. After three months, the Horner's syndrome began to retrogress and pain began to return. Benadryl, 50 mg., and 10 cc. novocaine 1 per cent without ephedrine were injected as described above. The patient has been free of pain for one month.

Meniere's syndrome. Six patients suffering from Meniere's syndrome with tinnitus aureum were treated by intravenous injections of novocaine and Benadryl. Ten cc. of 1 per cent novocaine without ephedrine and 30 mg. of Benadryl were injected intravenously every 48 hours. These injections were given in the office. One full minute is taken to give the injections. Usually, within six injections the tinnitus aureum, dizziness and nausea will disappear. The loss of hearing is not affected. The patients have remained free from the distressing symptoms of tinnitus aureum, dizziness and nausea for periods ranging from two months to two years. One patient had a return of symptoms within two months and was relieved by one subsequent injection with no further complaints for the past six months. Another patient had symptoms so severe that on a number of occasions she fell in the street and was taken to hospital by ambulance for emergency treatment. The tinnitus aureum and vertigo were great burdens for her. However, the intrave-

nous injections cause definite, if temporary, alleviation of her symptoms. The only relief she obtains is following the injections, which she has once or twice weekly.

In surgical cases, I have found Benadryl, whether given by mouth or injection, with barbiturates to enhance the sedatory effect of the barbiturates as pre-anesthetic medication (1). The Benadryl with a reduced dose of atropine can be used pre-operatively. Post-operatively, I have used Benadryl and Serpasil (reserpine) by mouth; 3T of each, four times daily, is of definite benefit in controlling the pain and post-operative complications of neurosurgical procedures (1). In these operations, both in adults and children, I invariably use Benadryl along with any antibiotics which may have to be given.

Summary and Conclusions

Diphenhydramine hydrochloride in the form of Benadryl has been used by me in various neurological conditions. I have found it to have a definite potentiating effect when used with novocaine. This combination as described in the text of this paper has been used with benefit in the following conditions:

1) Headache of any type except that of intracranial neoplasm or hemorrhage or endocrine headache. The methods described are efficient and prompt in action. It seems that the novocaine and Benadryl when given intravenously act on the diencephalon and basal ganglia. R. W. Barris (2) has found Benadryl to be of benefit in 17 patients with thalamic syndrome.

2) The pain of herniated intervertebral disc is definitely relieved in most cases by novocaine and Benadryl as described.

3) Trigeminal neuralgia and other forms of neuralgia are at least temporarily relieved by novocaine-Benadryl infiltrations in the region of the nerve or nerves involved.

4) The tinnitus aureum and vertigo of Meniere's syndrome are relieved totally, or in part, for prolonged periods by intravenous infusions of novocaine and Benadryl.

5) In surgical conditions, Benadryl, used pre-operatively, with barbiturates enhances the sedative effect of the barbiturates. Benadryl because of its "drying" action also diminishes the pre-operative dose of atropine. Post-operatively in neurosurgical cases Benadryl given with Serpasil lessens the need for analgesics and sedatives and seems to help reduce the incidence of hyperthermia.

My work with Benadryl has shown me that it is of definite value in the aforementioned conditions when used with novocaine. It seems to have an action both locally and centrally on nervous tissue. To my mind, its action in severe recurrent headache brings quicker and more prolonged relief than any other method.

Toxic reactions are confined to dizziness and occasional rise in blood pressure. The dizziness is not a contraindication and is overcome by rest or "smelling salts", or both, within 20 minutes. It is not recommended that Benadryl be given intravenously to patients suffering from hypertension or heart disease.

The potentiating effect of diphenhydramine hydrochloride or novocaine is a definite action, whether used locally or intravenously. The methods of using Benadryl and novocaine as described in the text of this article will aid the physician in alleviating the complaints of many patients.

BIBLIOGRAPHY

1. Rosner, S.: The use of reserpine in neurologic surgery. *J. Internat. Coll. Surgeons, 25:* 480–482, 1956.
2. Barris, R. W.: The use of benadryl for symptomatic relief of "thalomic pain." *Neurology, 2:* 59, 1952.

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SOME FACTORS IN CHRONIC WARD RECOVERY

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Over the past number of years there has been an increased interest in the treatment of chronic regressed schizophrenic patients. It has led to the recognition that this picture of deterioration is not necessarily the outcome of an irreversible process. This "Rubric of Regression" as Klapman (1) calls it is a resultant of many factors: the ward atmosphere, enforced inactivity, lack of relationship between patient and nurse and lack of communication and rapport in the psychiatrist-nurse relationship. Among the more important factors in any ward is the therapeutic atmosphere which is determined by the psychiatrist-nurse-patient relationship. The purpose of this paper is to study the effect of two sets of factors: 1) The reorientation of the attitude of the nursing staff, the results of increased communication and rapport between psychiatrist and ward supervisor; 2) The effect of the introduction of tranquillizing drugs on this psychiatrist-supervisor relationship and nurse-patient relationship. This study is a 3-year study covering the years, 1953, 1954, 1955 and to date, 1956.

The Ward

The ward under study is a 75 bed, closed ward of female, chronic disturbed patients. It is the ward of the hospital to which violent and assaultive patients are confined. Their age varies from 18 to 64 years.

Under 25 years	14 per cent
25 to 35 years	29 per cent
35 to 45 years	44 per cent
45 to 55 years	11 per cent
55 years and up	2 per cent
Mean age	37 years

Their average length of stay in hospital is approximately 15 years.

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Diagnosis

The diagnostic breakdown is as follows:

Schizophrenics	70 per cent
Epileptics	10 per cent
Mental defectives	10 per cent
Schizo-affective psychosis Manic depressive psychosis Psychoneurosis	10 per cent
	100 per cent

The Atmosphere

The atmosphere on the ward before reorganization was, on the whole, one of apathy. The patients were in the main regarded as hopeless cases. The ward itself was regarded by some patients as a place of punishment to which they might be sent if they did not conform to the pattern of hospital behavior. One of the main purposes of the nursing staff was to prevent aggressive assaultive behavior by the patients, a goal achieved by means of seclusion and chemical restraint (mainly barbiturates). The principal motivation was protection for the patient and for the nurse. Physical needs were carefully attended to, but activities directed towards the emotional needs of the patient were secondary. The nursing was principally oriented towards controlling the behavior of the patients so that they conformed more or less to what is called by Martin (2), "the well institutionalized patient", which means that the patient has made a more or less total surrender to institutional life. The institutionalized patient is resigned and co-operative, has ceased to question his position as a patient and has become too passive to present any problem of management. He has in the process lost much of his individuality, initiative, drive and resourcefulness. Frequently the attitude of the nurse towards her patients was one of apprehension, since she was constantly expecting to be assaulted by them; therefore she was quick to move in and stop any expression of hostility or aggression. The majority of the patients spent their day sitting in the day

room, while the rest were occupied by ward work with a few working in the hospital industries. The most disturbed patients were handled by seclusion, sedation or E.C.T. The relationship of the ward to the rest of the hospital was impaired because of the apprehension of the nurses which fostered the patient's negative attitudes. The intermingling of the patients of this ward and the other patients of the hospital was minimal. Only a carefully selected group from this ward were allowed to take part in the regular activities of the other hospital patients.

The Approach to the Problem

In 1954, the feeling among the medical and nursing staff was that something should be done about the problem. It was felt that the staff on the ward had to be oriented to the needs of its patients. This was done by daily morning meetings between the ward supervisor and the psychiatrist during which each patient and the group as a whole were discussed. The conference was a two-way discussion between the psychiatrist and the ward supervisor. It was emphasized that in a therapeutic ward the patient is allowed to express conflict; the staff members try to understand the patient and his problems; the interpersonal environment should offer the patient the experience of being occupied and respected as a person in his own right; the opportunity is provided to act out his conflicts within the limits of safety and group living. On this particular ward special emphasis was given to nursing techniques in dealing with disturbed behavior. Such disturbed behavior was scrutinized in terms of possible symbolic significance and regarded as one form of communication. This was examined with regard to the patient's previous ward behavior and experience, on the one hand, and, on the other, the expected reaction to this behavior on the part of the nurses. Each problem as it arose was discussed by the nurse and the ward psychiatrist when the nurse deemed it necessary. The psychiatrist also was available throughout the day in case any emergency arose. It was felt that the personal contact with the nurse on the ward was an important factor in promoting a better atmosphere. This was achieved by impromptu meetings of various members of the participating ward personnel. Whereas previously all treatment had been authoritatively decided by the psychiatrist, it now became the responsibility of the ward supervisor and the ward nurses to suggest and discuss treatment. It was emphasized that the nurses' observation based on an understanding and appreciation of the motivation of behavior was to be the basis of the therapeutic approach. The hierarchical barriers were lowered, and each individual was recognized as a specialist in his or her own field with ideas to offer, all directed towards the welfare of the patients. In order to facilitate the desired close nurse-patient relationship it was felt that the ward psychiatrist should not intrude directly in this relationship until 1) the patient requested to see the psychiatrist or 2) the nurse felt that the patient had progressed to the point where she felt intensive psychotherapy by the psychiatrist was indicated. Therapy of the patient was controlled by the psychiatrist; the therapeutic approach to the patient was discussed between the psychiatrist and the nurse and every facet of the case examined. The patient's case record was consulted, and a definite approach to the patient decided upon. In working with chronic patients in which the process of recovery is slow, it was felt recognition by the psychiatrist of the job done was necessary. Every little success was commented upon and approval expressed. The psychiatrist acted as mediator between the administration and the ward supervisor who had the opportunity of abreacting to the psychiatrist her frustrations, trials and tribulations.

Tranquillizers

Chlorpromazine was introduced on the ward as a treatment in September, 1954. All the available literature was given to the nurses in order that they might acquaint themselves with the drug. Patients were selected by the ward supervisor and recommended by her for treatment. Each individual case was discussed between the psychiatrist and the ward supervisor in making the decision as to who should have the drug. The criterion for selection for chlorpromazine administration was non-response to nursing care. Chlorproma-

TABLE 1.—AVERAGE PER MONTH

	1953	1954	1955	1956
Largactil	0	6	22	31
E. C. T. (treatments)	57	74	70	21
Paraldehyde	11 ounces	26 ounces	1½ ounces	0
HMC No. 1	29 tablets	8 tablets	⅖ tablets	1½ tablets
HMC No. 2	3 tablets	⅘ tablets	0	0
Apomorphine	7/10 grains	2½ grains	⅕ grains	0
Sodium amytal	263 grains	104 grains	44.8 grains	42 grains
Seclusion	2,688 hours	872 hours	788 hours	630 hours

TABLE 2.—COMPARISON OF HOURS OF SECLUSION*

Two-month Period Prior to Change in Nursing Technique 1953		Two-month Period Following Change in Nursing Technique 1954		
No. hours seclusion	Mean No. hours seclusion	No. hours seclusion	Mean no. hours seclusion	Percentage reduction
2,947.25	68.54	376	18.74	88.72

* No. of patients—43.

zine was to be used in the hope that the patient would become more accessible to relationship therapy. Each case was dealt with individually during the morning meetings, and dosage was carefully regulated to produce the desired effect. The daily dosage of Largactil varied from 150 mg. to 350 mg. and Serpasil from 3 mg. to 9 mg., either singly or combined.

ASSESSMENT

In order to obtain an objective evaluation of the project it was felt that a team of observers who were not emotionally involved in the plan should assess the progress made, and the research team was called upon to fill this evaluative role. The results of the program in terms of reduction in use of sedation and in terms of the need for seclusion and E.C.T. are presented in table 1. The data presented were obtained during the same five months April to August of four consecutive years 1953, 1954, 1955 and 1956.

In order to break down, if possible, the effect of the following two factors (a) nursing care and (b) chlorpromazine, we utilized the number of patient seclusion hours as the criterion of change. The findings were reported in a previous study done with nicotinic acid (3). Using seclusion hours as an indication of nursing technique, we can state from the accompanying figures (table 2) that a reduction of 88.72 per cent was achieved in seclusion hours due to better nursing care and attention.

DISCUSSION

The improvement in the ward as reflected in the above tables was due to an awakening of interest in the emotional foundation of the patients' behavior. Whereas little identification existed between the patient and the nurse, this identification now manifested itself in many different ways. For example, the nurses make efforts to move the patient to a better environment, with a frequency which heretofore was not so prevalent. In the past the nurses were quite content to see patients sitting quietly. With the heightening of morale and interest the nurses themselves decided that some form of activity should be introduced. This activity was geared to the emotional needs of their patients. Since at the start of the project no occupational therapy was available on this ward, the nurses took over the role of O.T. nursing and provided occupational therapy on the ward and outside activities. The beneficial results of a specially scheduled program of occupational activity which was called the gardening project have already been reported (4). Nurses learned new skills to guide and conduct recreational programs. They learned how to run the projector so that the patients could have films on the ward. Nurses with muscial talents provided music for the patients as a recreational experience. An increased effort was made to bring patients to other activities in the hospital; this promoted integration of the ward

with the rest of the hospital and helped to make this special population socially acceptable to the remainder of the hospital population. Whereas the ward was not infrequently regarded as a place of assignment, the nurses now identify themselves with the ward and work steadily toward the improvement of its status and of the care of the physical and emotional needs of their charges.

To the nurses, the ward is no longer a "refractory ward" but is "our ward". "Our ward is the best one in the hospital." One can now state that the morale of the nursing staff on this particular ward is presently perhaps of the highest in the hospital. This change in ward morale can be attributed to the gradual shift in the pattern of the psychiatrist-nurse relationship of the ward. The pattern of relationship is described and the change evaluated by the assistance of an outside agency, namely, the members of the research department. These members were utilized to direct observation and direct discussion on each level. Using this approach, the ward psychiatrist-ward supervisor relationship was observed and commented upon from the observation point of both the research psychiatrist and the research nurse; each bringing his own emphasis as determined by his own status.

Discussing the development on this ward the following observations were made:

1. There was a gradual shift in roles. The psychiatrist is no longer a figure of authority who gives orders with the nurses playing a dependent role. This same pattern of behavior was carried over to the nurse-patient relationship as well. The nurse's role is now more that of an equal member of a co-operative relationship based on mutual interest, understanding and tolerance. Nurses discuss each case in terms of the patient's emotional needs; they plan for the future and present their recommendations of the plan of treatment they think might be beneficial to the patient. This change in the nurses' function was due to the change in the general attitude and outlook of both the psychiatrist and nurses.

The welfare of the ward is no longer the responsibility of the ward psychiatrist but is now a shared responsibility of the ward staff, one member of which is the ward psychiatrist. Whereas previously the psychiatrist was regarded as a representative of a remote administration and not as an integral part of the ward unit, he is now a member of a team utilizing all the resources for the benefit of the patient.

The Effect and Utilization of Tranquillizers

The attitudes which guide the management of such a unit as the described ward are, of course, largely determined by the cultural and personal background of the personnel. However, the available treatment methods also play a significant part in deciding what kind of treatment philosophy will prevail on the ward. A chronic disturbed ward confronted with a small number of staff generates a great deal of anxiety for all concerned. It is perhaps for this reason that the rigid authoritarian system of ward management was maintained for so long in spite of the promulgation of different principles. The great amount of tension, anxiety and feeling of hopelessness usually lead to a withdrawal of interest and the maintenance of routine on authoritative lines as a defense mechanism. The reorientation of the nursing staff and changes in the psychiatrist-nurse relationship greatly diminished this anxiety. The introduction of the tranquillizers also diminishes this level of tension considerably. The tranquillizers appear to act as catalysts in the process of liberalizing relationship patterns on the ward and therefore promote better psychiatric treatment. We consider not only the direct effect of the drugs on the patients but also the effect that the use of these drugs has on the ward personnel by increasing optimism regarding the patients' recovery.

From a dynamic point of view, pharmacotherapy reduces the amount of anxiety in the patient leading to a decrease in the frequency of disruptive behavior. This leads to 1) increased acceptance by the staff of the patient, 2) decreased anxiety of the nurse, and 3) adaptive behavior on the part of the patient. This decrease in anxiety and tension on the part of both nurse and patient releases the potentialities for socially adaptive behavior. These attitudinal changes on the part of the

nurses lead to more active participation in interpersonal exchanges with the patients.

Effect on the Ward as a Whole

This project resulted in marked improvment in self-care, work, interest in ward activities and better socialization of these patients. Destructive and aggressive behavior was markedly reduced. Seclusion is now minimal. Interest in outside ward activities is increased. Patients are now taking a more active part in the various activities in the hospital. Whereas formerly it was a very rare occurrence for patients on this ward to be rehabilitated and sent home, over the past six months five patients with average length of stay eight years have gone home. The ward itself is no longer regarded by the patients as a place of punishment. They feel that the status of the ward is equal to any other ward in the hospital. The nurses and the psychiatrist are now readily approached by the patients to discuss their various problems and future. The atmosphere of the ward is now an active therapeutic one with patient, nurse and psychiatrist working hand and hand toward rehabilitation.

Summary

The purpose of this study was to determine the effect of two factors in chronic ward recovery: 1) The reorientation of the attitude of the nursing staff and the results of increased communication and rapport between psychiatrist and ward supervisor, 2) The effect of the introduction of tranquillizing drugs on this relationship. This study covers the period 1953 to 1956. The results are as follows:

1) A marked improvement has occurred in the ward as reflected by diminished use of seclusion, E.C.T. and barbiturate medication.

2) A marked increase in the morale of the nursing staff attributable to a gradual shift in pattern of psychiatrist-nurse relationship has taken place on the ward. The psychiatrist is no longer a figure of authority with the nurse in a dependent role. The nurse is now a more equal member of a co-operative relationship based on mutual interest, understanding and tolerance. This has led to increased identification of the nurse with her ward and patients and thus to a better therapeutic atmosphere.

3) By integration of the ward into the activities of the hospital, the status of the ward was raised, helping to make this special group socially acceptable to the rest of the hospital population.

4) The project resulted in marked improvement in self-care, work, interest in ward activities and better socialization of the patients. Destructive and aggressive behavior became markedly reduced, seclusion minimal and interest in all hospital activities stimulated. It has been possible to send five patients, whose average stay in the hospital was eight years, home directly from this ward, whereas before it has been an extremely rare occurrence for any patient to go home directly from this ward.

5) The effect of the tranquillizers may be summarized as follows: (a) a reduction in the amount of anxiety in the patients leading to a decrease in disruptive behavior, (b) this leads to increased acceptance in the staff of the patient, (c) it decreases the anxiety of the nurse, and (d) leads to adaptive behavior on the part of the patient. These attitudinal changes on the part of the nurse lead to more active participation and interpersonal exchange with the patients.

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BIBLIOGRAPHY

1. Klapman, J. W.: Common sense group psychotherapy for mental hospitals. *Dis. Nerv. System 16:* 24, 1955.
2. Martin, D. V.: Institutionalization. *Lancet,* pp. 1188–1190, 1955.
3. O'Reilly, P. O.: Nicotinic acid therapy and the chronic schizophrenic. *Dis. Nerv. System, 16:* 1955.
4. O'Reilly, P. O., and Handforth, J. R.: Occupational therapy with "refractory" patients. *Am. J. Psychiat., 111:* 1955.

RECREATIONAL COUNSELING IN THE PSYCHIATRIC SERVICE OF A GENERAL HOSPITAL[1]

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Modern hospital psychiatry coordinates the efforts of several disciplines in executing its mission of helping patients to attain the kind of adjustment necessary for community living. The techniques of some of these disciplines are effective with one patient and those of others with another. Some patients reach but a tenuous level of functioning under any therapeutic regimen. When the mission of a psychiatric service is to return the patient to the community in a matter of a few months, it is necessary to think in terms of initiating growth processes with the idea of their continuance after discharge. It is accordingly essential to concern oneself with the environment to which the patient returns to insure, if possible, that it is calculated to foster these recuperative processes. Our service has met with some success in mobilizing community resources, and we feel that the results justify the considerable energy expended in effecting them. This report contains a description of one program which has attracted some attention in recreation circles and which we feel may be of equal interest to psychiatrists. The object has been to extend the techniques and facilities of a hospital discipline into the community so that some patients may be able to use them in maintaining themselves after discharge.

It has been our experience that with sustained psychiatric treatment in the hospital environment withdrawn patients have come to participate with apparent enjoyment in social-recreational activities. Contact with patients who have required rehospitalization here or at nearby psychiatric centers indicates that some tend to lapse into solitary ways on discharge and thus set the stage for reactivation of old pathological patterns of behavior. Our observations suggested that in several of these cases, specific guidance in this area—living through the non-working hours—was indicated. As a consequence, a new patient service was instituted which we termed *Recreational Counseling.*

Though we believe that a patient should be encouraged to assume as much responsibility for his own behavior as he is able to handle, there are a number of patients from varying diagnostic groups with whom supportive therapy making minimal demands on them is indicated. There are others who experience the kinds of insight that enable them to mobilize their assets for a more rewarding adjustment after hospitalization than they had before who yet need help in utilizing their energies constructively in certain areas. The vocational area is one in which this kind of guidance is traditionally given. Getting a job and staying on it are used by many as hallmarks of successful rehabilitation. It may even be that, because work adjustment is so highly regarded as a criterion of over-all emotional adjustment, some patients are specifically prepared for it almost after the fashion of preparing students to pass specific examinations. There are a great many other hours in a person's day, and we have found that the precipitation stress preceding hospitalization was in some cases most apparent during these hours.

The fact that this hospital is in a large metropolitan area and that a good proportion of the patients are from this area has been of considerable importance in treatment. Members of the patient's family and of the community are available for service on the psychiatric team. A large number of the leaders of the social-recreational activities are volunteers from the community, and several of the activities take place in clubs and community centers in town. There is an effort to prevent an estrangement of the patient from the circles in which he moved prior to hospitalization. Many patients have given clear indication that they

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are in greater rapport with their community while hospitalized than they ever were before. Patients who have experienced difficulties in making social contacts are helped by the staff and volunteers to make such contacts and are supported in them when they are made. Most of these men are not prepared to sustain the rapprochement with their social environment attained during hospitalization without help that extends into their post-discharge life. The Recreational Counseling Program was designed therefore to help patients maintain the level of social contact reached while hospitalized and to guide them in the use of their leisure time. It is an interdisciplinary program carried out by the hospital Neuropsychiatric Service, the hospital Special Services and the City Recreation Department. The working unit or counseling team consists of a member from each of these groups, at present, a psychologist, a hospital recreation worker, and a city recreation worker.

Recreation counseling is available to patients on both an individual and a group basis. Individual counseling is done where the psychiatric staff feels that use of leisure time or need for social contact or group affiliation is a prime factor in the current illness. The term *leisure time* is meant to convey the waking hours other than those spent at work for the majority of patients and the greater part of each day for those who are capable of only a marginal or submarginal vocational adjustment and for the retired and those about to retire.

The techniques of individual recreational counseling are similar to those of the counseling psychologist with social satisfaction rather than job satisfaction the goal. The patients' feelings about social contacts have to be worked with as well as the resistances caused by association with such bromides as "get a hobby" or "get interested in something to take your mind off yourself". The counselor and the patient explore the patient's need in this area and work together toward its resolution. In this type of counseling, the patient contact is done by the psychologist. He is able to call upon the hospital recreation section for help with regard to the patient's current situation and on the city recreation worker for advice with regard to opportunities for the patient after discharge. The team members work together in helping the patient make contacts that can last after discharge. The therapist is able to follow up on these contacts and work through whatever practical difficulties might ensue.

To date 10 patients have received individual recreational counseling. The following cases illustrate the kinds of extramural contact that are made:

Case 1: A 28-year-old, single, white male. He had a psychotic episode when he tried to make a break from his grandfather's farm and live independently. He had no contacts with people his own age and felt the need for such contacts. During counseling he became associated with a social group in town and remained active with it after discharge. He credits the association with helping him maintain himself in the city.

Case 2: A 21-year-old, single, Negro male. He became psychotic while in service. He complained that he never felt part of any group. He is a good musician and while in the hospital, enjoyed participation in orchestral groups. He was referred to and became part of a community orchestra before discharge and remained with it after leaving the hospital.

Case 3: A 36-year-old, married male. This man was originally hospitalized for somatic complaints, but was referred to psychiatry when after discharge from the medical service, he was unable to return to work. The reason given was that he could not bring himself to meet people. He is still a patient on the psychiatric service and is socializing well. Concurrently with hospitalization, he is working as a volunteer in the City Recreation Department. His assignment calls for a great deal of socialization and some teaching. Prior to this assignment, he was mixing well with other patients and staff. He experienced only slight distress in so doing, but feared that he would be unable to socialize outside the hospital. His experiences as a volunteer worker have greatly increased his confidence in this respect. It is anticipated that he will be discharged shortly.

The counseling team reaches most of the patients through the recreational counseling groups. Each of these groups, including as participants the patients on a ward and the three team members, meets every second week. The patients in these groups go to group activities together and thus accumulate a backlog of common social experiences. They ordinarily bring these experiences into the group discussions and comment on their reactions to them. This serves as a point of departure for observations about their pre-hospital experiences in the social-recreational area and of expectations about the future.

The three counselors interact freely with the

patients and stand on no protocol with regard to specific roles. Their contributions are weighted, however, by their different experience. The psychologist brings to bear his knowledge of group dynamics and his skills in group therapy; the recreation workers, their knowledge of recreation principles and practice. Having members from the hospital and city gives the team a knowledge of hospital and community programs and facilities. It is thus possible for the counselors and the patients to effect some continuity with respect to therapeutic recreational and social activity after discharge.

As indicated above, the patients have many social and recreational activities away from the hospital. In addition to these, the counseling groups go to places in the city such as clubs, schools, sports centers, and community centers to learn what facilities are available and how they can be made use of. In some cases, patients have been initiated into groups in which they expressed interest prior to discharge. Members of such organizations have come to the hospital to talk about and demonstrate what goes on when they get together. Interest on the part of the patients has run the gamut from amateur ball teams to social clubs for those over sixty.

Between 150 and 200 patients have been in recreational counseling groups. The most noticeable results have been in the following areas:

1. Strengthening of existing affiliations: Patients have indicated renewed interest in church activities and have reported reactivation of memberships in lodges and clubs. Several have begun to think in terms of recreational activity that involves the whole family.

2. Formation of new ties: Contacts made while in the hospital have been maintained. Some patients of retirement age have profited from introduction to social groups in their age range. Several have become involved in planning a program of activity to take up the slack caused by retirement. The authors feel that formal counseling such as described in this paper may prove particularly effective with the large numbers of older patients currently in psychiatric hospitals.

3. Knowledge of recreational facilities and of how they can be used: Learning how to avail themselves of facilities and thinking in terms of such outlets have been of general value. The counselors also were amazed at the social, recreational and educational opportunities that existed in the community. Some patients have looked into the social-recreational opportunities in communities distant from the hospital, and the city recreation department is helpful in this area.

4. Mobilizing community resources: Not the least of the results of this program is the involvement of individuals and groups in the community in mental health problems. The program demonstrated that large segments of the population are willing to help if called upon and can be relied on to further rehabilitation processes when given some professional guidance.

Summary

Where the mission of a psychiatric service is to return the patient to his home community in a relatively brief period of time, it is necessary to concern oneself with whether the environment to which he returns is calculated to foster recuperative processes. One method of extending the techniques of a hospital discipline into the community is discussed. Some illustrative cases are presented. The results of the program include 1) strengthening of existing affiliations; 2) formation of new ties; 3) learning how to avail oneself of community facilities; 4) mobilization of community resources in fostering mental health.

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SOME PHYSIOLOGICAL RESPONSES IN NEUROTICS

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Psychosomatics is an everyday problem to the clinician. That is to say, somato-emotional and viscero-emotional responses exist, and their relationship to clinical illness is often suspected. But hard facts are so lacking, and hypothetical supposition and pattern weaving so rife, that the ordinary practitioner is still very sceptical (5). Most of them are empirical in their approach to medicine, and their scepticism is not lessened by the apparent difficulty in successfully applying any of the current dogmas of psychosomatic therapeutics. Articles on psychosomatics are often too technical (especially methodologically and statistically) or too diffusely theoretical and philosophical (8) to appeal to those whose interests are strictly pragmatic.

However, in recent years, a series of papers by Lacey *et al.* (e.g., 10) has made some attempt to establish a physiological response pattern of a relatively fixed kind in individuals exposed to mild stress. In addition Alexander's theory of specificity of response to various stresses (especially emotional) has some currency in present day writings on the neuroses (1). This theory maintains that each individual responds to stress in one specific system (2). Malmo and Shagass (13) have tried to demonstrate the validity of this concept in the laboratory and its relevance to presenting symptoms in psychosomatic illness. Moreover, Deutsch (4) and Selye (16) have added the additional determining factors of previous (childhood) damage to an organ, thereby rendering it particularly unstable.

The present investigations set out to establish whether the response specificity and Lacey's hierarchy of responses could be reproduced in a group of neurotics whose illness was sufficiently well established to necessitate addmission to hospital. For confidence to exist in the results, two tests were given, with one month's interval between. Great importance was attached to this reproducibility of results. If similarities are present after this time lapse, then the findings are demonstrably fixed and reliable. Certain questions relating to presenting symptoms, early conditioning, and the effect of personality attitude were also considered.

METHOD

Twenty subjects (12 men, 8 women), who were all in-patients at a long stay neurosis center and whose ages ranged from 18-57, were all subjected to a mildly stressful procedure. They were a control group used in an enquiry into the action of a drug and, as such, had no treatment during the intervening month beyond the exhibition of a placebo and the ordinary exposure to a hospital environment. They were placed in a piece of apparatus which measured five physiological variables during stress. The method is borrowed from Malmo and Shagass (13), and measurements were carried out as follows (using 5 channels of a 6-channel Ediswan Electroencephalograph):

1) *EEG alpha inhibition*—Two electrodes were placed on the posterior temporo-occipital regions, and the time during which the alpha rhythm was inhibited was measured in seconds—Channel 1.

2) *Neck muscle tensions*—A copper electrode was placed over the sterno-mastoid muscle and another over the cervical spine posteriorly—Channel 2.

3) *Pulse rate*—Copper electrodes were placed on the volar aspects of the wrists as in lead I of the ECG—Channel 3.

4) *Finger pressure*—To measure the extent of finger pressure, the hands were placed on a cross board, with the index finger of each hand resting on a carbon microphone—Channel 4.

5) *Respiratory disturbance*—An elastic webbing belt was fitted round the subject's lower chest, having a sewn-in microphone with cellulose packing in such a way that chest movements during respiration were recorded. This was a somewhat crude method, but it did reveal alterations in the respiratory rhythm when this occurred—Channel 5. These particular systems were chosen because of the experience of others, who found respiratory

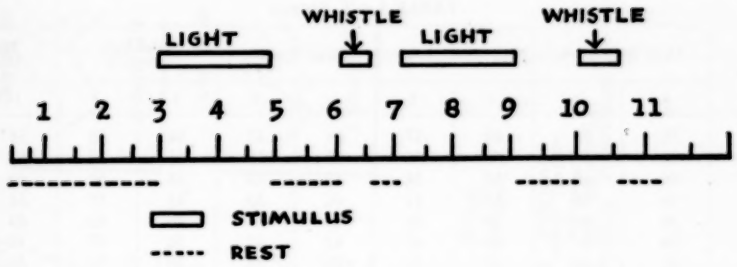

FIG. 1

disturbances (13) and skeletal muscle tension (9, 13, 15) the most delicate measures of anxiety.

The subject was installed in a chair with these various attachments, and the stress was provided by a stroboscope flashing at 17 cps, mounted on a metal arm an inch or two from his face. In addition, a loud whistle blast was used to evoke the startle response. In a small pilot study using six hospital staff, it was ascertained that non-neurotic individuals tolerated these stresses easily. Procedure was as follows:

The patient was told that he was being tested for ability to relax, and that during this test, sometimes the light would flicker and sometimes he would hear a whistle blow. It was emphasized that he must try to remain completely relaxed throughout. After being installed in the apparatus, 3 minutes were allowed for a resting pattern to become established. For the fourth and fifth minutes, the light flashed continuously, the patient being asked to open his eyes for 20 seconds and then close his eyes for 20 seconds throughout this time. No stimulus was given during the sixth minute, but at the beginning of the seventh minute, the whistle was sounded. During the eighth and ninth minutes, the light was again switched on as before; the tenth minute was a rest period; and the whistle sounded again at the beginning of the eleventh minute. Recording ended after 11 minutes as this was felt to be as much as the neurotic patient could well be asked to tolerate (fig. 1).

Early conditioning—A careful enquiry into each patient's medical history was carried out, particularly with a view to repeated illness in an organ (e.g., recurrent bronchitis) in early life and childhood, or one grave illness, or even the presence of a dramatic chronic illness in a parent or other adult to whom the subject was chronically exposed, or with whom he or she closely identified (e.g., maternal asthma).

Personality attitudes—Each patient was assessed as predominantly 1) "anger-in", if he regularly suppressed his emotion; (2) "anger-out", if he were free and outgoing in his behavior and verbal comments; and 3) "anxiety", if he were characteristically anxious, apprehensive, or frightened. This is a classification given by Funkenstein *et al.* (7). The judgments were clinical and were based on observation of the patients in therapeutic groups, ward behavior, and individual interviews, and were made after consultation with ward sisters, charge nurses, and psychiatric colleagues.

TREATMENT OF DATA

1) Alpha blocking time. In the opinion of Davis (3), Ulett *et al.* (17), and many others, alpha rhythm is only present when the subject is relaxed and reasonably tranquil. The time interval in seconds during which the alpha rhythm was inhibited following applications of the four stresses was therefore measured—5 seconds and above counting as 5 (maximal). The average of the four responses was taken as "alpha blocking time".

2) Neck muscle and finger pressure. In both these cases maximal pen excursion was given an arbitrary score (4) and was estimated visually. A flat tracing had the score O. Some tense individuals had considerable muscle activity even at rest and could not relax. All the "stress" scores—S—were added together (the 4 minutes of light flicker and the two half minutes which followed whistle blast), and the resting scores—R—(the remainder of the

TABLE 1.—T. SCORES

Case No.	Alpha Suppression		Neck Muscle Tension		Finger Pressure		Pulse Rate Variability		Respiratory Disturbance	
	1	2	1	2	1	2	1	2	1	2
2	56	58	49	47	56	42	64	58	34	60
4 (S)	30	57	60	53	63	58	45	50	63	54
6 (X)	56	40	55	58	42	53	45	50	49	58
7 (S)	56	58	55	47	46	53	45	55	34	41
9 (S)	36	36	49	53	46	53	36	50	49	54
11	56	30	49	47	42	42	54	55	34	41
13 (S)	42	44	55	53	70	53	36	50	34	41
15 (S)	56	58	70	64	42	42	54	42	34	41
18	56	58	42	58	42	70	64	42	34	41
19	42	40	42	47	42	62	64	59	49	41
21 (S)	56	58	42	53	46	42	54	42	62	70
22 (X)	57	58	64	64	63	66	49	59	54	58
23	42	58	42	47	42	42	54	42	54	47
26	56	57	42	47	46	58	45	59	70	51
29 (S)	42	44	55	47	56	53	36	42	49	51
32	42	44	42	53	42	42	58	42	41	41
33	56	48	42	64	42	53	45	42	41	41
37 (S)	56	58	42	53	46	64	58	70	54	47
38	56	48	60	47	42	70	45	42	54	51
39	48	48	42	47	59	42	45	55	54	58

S = Same peak response in test-retest.
X = Only 0.01 sigma short of peak value.

test) were subtracted; thus S-R gave a single score in each case. As explained elsewhere positive and negative signs were ignored (6).

3) Similar S-R values were obtained for pulse rate by counting the rates during stress and resting periods.

4) Respiratory deviations were scored as for alpha blocking time—5 seconds being again maximal and the average of four readings being the definite score.

To make the results intelligible, the frequency distributions of all measurements were expressed in T. score form. The T. scale was devised by McCall, and it consists essentially in "normalizing" the distribution (18). Equivalent scores in a normal distribution replace the original test scores by reference to tables of areas under the normal curve. The new mean is now given the value 50, and each standard deviation has the value 10.

This makes comparison between different physiological systems possible, for the units now have identical meanings in each case. That is to say, if a man scores 50 for pulse rate variability and 50 for respiratory deviation, it means that he responded to the stress to the same extent in both systems, and these responses were the average ones for the group. On the other hand, if he scored 70 in muscle tension, this indicates that his response was 2 standard deviations above the average of the group in this physiological measure (table 1).

Results were examined to see whether Alexander's contention was true that each individual responds maximally in the same physiological system on each occasion, with the Malmo and Shagass elaboration that this system was linked to the presenting complaint. The reproducibility of a hierarchical pattern of responses was also examined. To compare the patterns of responses, reaction profiles were constructed (following Lacey) with T. scores on the ordinate and physiological systems on the abscissa (fig. 2). The similarity between the profiles is calculated by the number of reversals in position in the hierarchy which take place in comparing the first and second tests. Lacey used this concept of reversals after pointing out how difficult it was to express the similarity of reaction profiles in any simple quantitative manner, for no accepted statistical technique exists. The calculations are made as in the following example—profile 21: alpha suppression > finger pressure > neck muscle tension > pulse rate variability but < respiratory disturbance, and so on, on

Case №2
6. Reversals
Case №4.
4. Reversals
Case №18
6 Reversals
Case №18.
7 Reversals.
Case №33
7 Reversals
Case №37
3 Reversals
Case №6.
6. Reversals.
Case №7.
3. Reversals
Case №21
3. Reversals
Case №22.
4. Reversals.
Case №38
5 Reversals
Case №39
5 Reversals.
Case №9.
1. Reversal
Case №11.
4. Reversals
Case №23
9 Reversals
Case №26
6 Reversals
Case №13
2. Reversals.
Case №15.
0. Reversals.
Case №29
2. Reversals.
Case №32.
7. Reversals.
1st. Test.
2nd Test.
Alpha ... Suppression
Neck Muscle Tension
Finger Movement
Pulse Rate Variability.
Respiratory Disturbances.

FIG. 2

the first occasion. On the second occasion, alpha suppression is again > finger pressure, but in three variables the values are reversed, e.g., finger pressure is now < neck muscle tension. Case 21 is therefore said to have three reversals. A total of 10 reversals is possible, and we follow Lacey proportionally in considering four reversals or less a comparatively stable pattern, though admittedly the criterion is no better than a subjective impression on looking at the profiles (fig. 2).

Results

Specificity: Peak values in the same system were recorded from 8 out of the 20 subjects in the test-retest comparison (table 1). Two others (nos. 6, 22) came so very close (only 0.1 sigma difference) that it was tempting to include them also. The number 8 is significant at the 5 per cent level of confidence (10 at the 1 per cent level). The average age of the consistent reactors was 38.5 (10 subjects) against an average of 33.3 (10 subjects) whose peak response differed in the two tests.

TABLE 2.—Frequency of Distribution of Reversals in Test-Retest Profiles

No. of Reversals	Subjects
0	1
1	1
2	2
3	3
4	3
5	2
6	4
7	3
8	0
9	1
10	0

Reaction profile: Lacey (11), working with children and carrying out his retest almost immediately, i.e., within the hour, was able to show a fairly coherent and consistent pattern of responses for each individual, i.e., 90 per cent of his population had 8 reversals or less out of a possible 15 reversals, and 50 per cent had 4 reversals or better. On the same analogy here (see table 2) 80 per cent had 6 reversals or better, and 40 per cent had 3 reversals or better. This group therefore does not show as much consistency, and since increasing age appears to improve the consistency, other explanations for the difference must be sought. It is possible either that the month-long gap is responsible for the difference, or that neurotics vary more than normal children. Yet neurotics are believed to be more susceptible to stress, hence their illness (14). The results of others have been inconclusive, even the very careful studies of Wenger (19).

Table 3 selects out the consistent reactors (8 in all) and compares their responses with 1) the presenting symptom, 2) the organ which seemed most likely to be weakened by early conditioning, and 3) personality attitudes. Only one case (no. 21) shows correspondence between early conditioning and physiological response. The presenting symptom was related to the responses in two individuals (nos. 13, 15). On the personality classification, 5 were assessed as "anger-in", 2 as "anger-out", and only one "anxiety" (the corresponding numbers

TABLE 3

Case No.	Consistent Response	Early Conditioning	Presenting Symptom	Personality Attitude
4	Finger pressure	Recurrent bronchitis	Insomnia, eczema	Anger-in
7	Alpha suppression	Atrophic testis	Impotence and asthenia	Anger-in
9	Respiratory disturbance	Nil known	Compulsions (counting)	Anger-out
13	Finger pressure	Juvenile convulsions	Pains in head, chest, legs	Anger-in
15	Neck muscle tension	Nil known	Feels tense and strung up	Anxiety
21	Respiratory disturbance	Pneumonia, pulmonary tuberculosis	Pain in back	Anger-out
29	Finger pressure	Nil known	Panic attacks	Anger-in
37	Pulse rate var.	Deformity of chest	Lack of energy	Anger-in

in the total population were 9, 5, and 6, respectively).

Discussion

In 8 out of 20 neurotic individuals, peak reactivity was obtained as a stress response in the same physiological system. There would seem therefore to be a tendency towards physiological constancy. What factors operate as determinants of the particular system in each case? Selye's teaching, well argued by Le Vay (12), is that this system is a "target organ" and is prone to become disorganized sufficiently to arouse symptoms if at any time the organism is exposed to more stress than it can well tolerate. For Selye, in fact, any illness can be described in terms of a stress syndrome, a faulty pattern of adjustment. Furthermore, the system yielding such symptoms will be a target organ by virtue of its having been notably weakened by some previous infection or injury, especially in early life. This brings Selye very close to Deutsch's view (4), that organ disorder in childhood (together with overt personality attitude and compliant environmental situations) determined to a large extent the disorder that takes place in later life—not a great advance on Adler perhaps, but progressing a little way from symbolism.

Three questions might reasonably be asked then of any investigation in this field: 1) What is the relationship between the presenting symptom and the individual's particularly vulnerable physiological system—his target organ? 2) What is the relationship between early conditioning and symptomatology in neurotic illness in later life? 3) In these cases in which a constant peak response is obtained, did early conditioning decide which physiological system would be maximally responsive?

So far as the first question is concerned, two cases, it seems, respond with the same system as yields their symptoms (nos. 13, 15). But of the 8 under consideration, only 4 offered a somatic complaint as their presenting symptom, and, furthermore, the present battery was a small one and did not by any means cover all possible reactions. Behind the results, therefore, other consistencies may lie hidden, and in future work it would seem better to design a battery for the individual cases in order to adequately test this hypothesis.

TABLE 4

Case No.	Early Conditions	Presenting Symptoms
37	Asymmetrical chest	Asthenia (but previously?)
19	Bronchitis +++	Backache
39	Headache at menarche	Headache
13	Juvenile seizures	Pain in head, chest, legs
7	Atrophic testes and impotence	Asthenia and impotence
21	Bronchitis, pleurisy, tuberculosis	Pains in back and rectum
2	Mother asthmatic	Cough, worry, loss of weight
4	Recurrent winter bronchitis	Insomnia, eczema

In the second place, of the 20 cases, 8 presented evidence of early conditioning (table 4). Of these 8, only 2 had complaints in their present illness referable to the conditioned system. Here again though, there are possible explanations for this rather low figure. These were all severe neurotics who had been ill for more than six months—in most cases for several years. At various times in the past the complaints in previous stages in the illness might have been more relevant. For example, case no. 37, although presenting at the time of the investigation with asthenia, had had an illness 3 months previously when he complained of shortness of breath and pain in the chest. On that occasion he had been investigated by a chest physician, and no organic disorder was found, apart from his asymmetrical ribs. In this neurotic episode, of course, he was showing symptoms in the system which we are here referring to as conditioned. It is a well-known fact that once a neurosis is established firmly, free-floating anxiety may attach to various objects, ideas, or anatomical structures. The symptoms possibly arise in the originally incriminated system and migrate later. It was quite obvious in fact that cases 4 and 21 were considerably handicapped by loss of elastica in respiratory tissue, but they had ceased to complain of that although it is possible that their original complaints were of

this kind. Both had been in indifferent health for years.

In the third place, early conditioning might have been expected to identify the system in which maximal response would be obtained. Of the 8 who did produce a consistent response, three had had a good deal of trouble in early life localized in the chest, and yet in only one was the respiratory disturbance score highest on both occasions. In all, 5 out of the 8 had recognizable early conditioning, but only one of the five responded to stress consistently in the corresponding system (table 3).

There remains the further question of personality attitudes and response specificity. It emerges (table 3) that of the consistent reactors 62.5 per cent are "anger-in", 25 per cent are "anger-out", and 12.5 per cent are characterized by "anxiety". Bearing in mind the small number involved and the absence of any formal test of personality applied to all the individuals, the results do seem to lend little support to the hypothesis that anxious people respond to stress in an elective manner, with the corollary that the "anger-in" group is more constant (presumably this is the type Alexander refers to as vegetative neurosis).

On the whole, considering the limited range of the battery of tests used, and the very wide range of possible physiological responses, there are indications that some regularity exists. Behind this regularity, more orderliness may lie, if more stringent experimental methods are used. By casting the net wider in future work, further identities and specificities, at present hidden, may be revealed.

Summary

A group of 20 neurotic subjects was exposed to mild stress on two occasions with an interval of one month intervening, and some physiological responses were measured on each occasion. Peak response was obtained in the same system in 8 out of 20 subjects. Patterns of response do not appear to follow a rigid hierarchical schema. The consistent reactors had a higher average age than the inconsistent reactors. In only a small minority of cases did the elective physiological system in which peak values were obtained on both occasions correspond either to the presenting symptoms or the locus minoris resistentiae.

Those individuals whose personality attitudes were characterized by suppression of anger were more consistent reactors than the other groups.

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BIBLIOGRAPHY

1. Alexander, F.: *Psychosomatic Medicine.* Its principles and Applications. New York: W. W. Norton & Co., 1950.
2. Ax, A. F.: The physiological differentiation between fear and anger in humans. *Psychosom. Med., 15:* 433–443, 1953.
3. Davis, P.: Technique and evaluation of the electroencephalogram. *J. Neurophysiol., 4:* 92–114, 1941.
4. Deutsch, F.: The psychosomatic concept. *Acta Med. Orient., 7:* 33–42, 1948.
5. Eastwood, N. B.: Significance of the discovery of Cortisone. *Lancet, 11:* 269, 1950.
6. Ferguson, R. S.: A clinical trial of Reserpine in the treatment of anxiety. *J. Ment. Sc., 102:* 30–42, 1956.
7. Funkenstein, D. H., King, S. H., and Drolette, M.: The direction of anger during a laboratory stress-inducing situation. *Psychosom. Med., 16:* 404–413, 1954.
8. Halliday, J. L.: Psychosocial Medicine. London: Wm. Heinneman, 1948, pp. 72–110.
9. Jacobsen, E.: *Progressive Relaxation.* Chicago: University of Chicago Press, 1938.
10. Lacey, J. I., and Van Lehn, R.: Differential responses in somatic response to stress. *Psychosom. Med., 14:* 71–81, 1952.
11. Lacey, J. I.: Individual difference in somatic response patterns. *J. Comp. & Physiol. Psychol., 43:* 338, 1950.
12. Le Vay, J.: Hans Selye and a unitary concept of disease. *Brit. J. Phil. Sa., 3:* 157, 1952.
13. Malmo, R. B., and Shagass, C.: Physiological study of reaction to stress in anxiety and early schizophrenia. *Psychosom. Med., 11:* 9–24, 1949.
14. Malmo, R. B., and Shagass, C.: Studies of blood pressure in psychiatric patients under stress. *Psychosom. Med., 14:* 82–93, 1952.
15. Sainsbury, P., and Gibson, J. G.: Symptoms of anxiety and tension and the accompanying physiological changes in the muscular system. *J. Neurol. Neurosurg. & Psychiat., 17:* 216–224, 1954.
16. Selye, H.: General adaptation syndrome and diseases of adaptation. *J. Clin. Endocrinol., 6:* 117, 230, 1946.
17. Ulett, G. A., Gleser, G., Winoker, G., and Lawler, A.: The E.E.G. and reaction to photic stimulation as an index of anxiety proneness. *Electroencephalog. & Clin. Neurophysiol., 1:* 23–32, 1953.
18. Walker, H. M.: *Elementary Statistical Methods.* New York: Henry Holt & Co., 1943.
19. Wenger, M. A.: Studies of autonomic balance in Army and Air Force Personnel. *Comp. Psychol. Mon.* 19, 1948.

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THE STRUCTURE OF EMOTION
II. The Physical Basis of Anxiety

D. STANLEY-JONES

The nature of anxiety has been a major problem of psychology for over fifty years. The problem is still unsolved. It is possible, however, that the study of the earliest manifestation of anxiety, that is in a screaming infant deprived of the breast, coupled with a knowledge of infantile physiology, may yield a clue to the physiology of anxiety in the adult.

The emotional life of breast-fed infancy is mediated almost exclusively in terms of its three oral reflexes, namely oral-sucking, oral-biting, oral-crying. These are the foundation of its mental life and of the later superstructure of its personality as an adult. The structure of the oral triad is such that oral-sucking and oral-biting are co-operative antagonists that work in balanced opposition in the taking of food, while oral-biting (closure of the jaw) and oral-crying (opening of the jaw) are mutually exclusive and non-coöperative antagonists, the third reflex upsetting the balance of the other two. As pacemakers to the bowel and the autonomic system as a whole, the polarity of oral-sucking and oral-biting is reflected in the polarity of the digestive movements of the bowel, in the opening and closing of the nearer sphincters, indirectly in retention and evacuation at all the pelvic orifices, and in the vasomotor reflexes of heart and blood-vessels that are concerned in the maintenance of thermostasis (30).

The oral reflexes are concerned also with the primary emotions of lust and rage: oral-sucking is the physical substrate of lust; oral-biting, of rage. The integration of lust with rage, of love with hate, is a physiological process, and their partition or dichotomy (as in the Œdipus complex) is both unhealthy and unnecessary. This view is based upon structural arguments and on the step-by-step homologies that have been drawn from the visceral and vasomotor functions of the autonomic; for these, it is maintained, are the physical substrate for the emotions (30).

The third element of the oral triad is oral-crying. Oral-crying involves an opening of the jaw, it is a direct antagonist of oral-biting which closes the jaw. Moreover, it is mechanically incompatible with oral-sucking. By interfering with both elements necessary to feeding, it destroys the co-operation between them. The balanced opposition gives way to disharmony, and integration is replaced by dichotomy. Oral-crying is a sign of physiological failure.

The three elements of the oral triad are related each to its specific emotion. Oral-sucking is the expression of lust, oral-biting of rage, oral-crying of anxiety.

The structural pattern of anxiety, in its relation to lust and rage, is identical with that of oral-crying in relation to oral-sucking and oral-biting. Just as oral-crying appears in place of oral-biting and indicates a breakdown from a tolerable to an intolerable sensation (such as hunger or pain), so anxiety appears in place of rage and indicates a breakdown from a tolerable to an intolerable degree of emotion. In brief, anxiety betokens a breakdown of homœostasis or physiological tranquillity.

Oral-biting hate is not, in itself, a threat to homœostasis. On the contrary, as a partner to oral-sucking love, it is as essential for the proper maintenance of homœostasis as is the orthosympathetic essential to the parasympathetic. Neither of this polar couple can dispense with the moderating influence of its fellow. Biting is a necessary adjuvant to sucking and swallowing. In the sexual sphere, hate and its associated orthosympathetic are necessary to supply the dynamic of chase and capture, or the more civilized counterparts of courtship, rivalry and earning a living. Without that energy of life that derives from oral-biting hate, there could be no procreation of children, no fighting of the male for the safe guarding of the pregnant mother, no fighting of the female for the protection of her young. The role of hate as the complement to

love is as necessary in the economic struggle for human existence as in the primitive conditions of the jungle. The orthosympathetic supplies the dynamic for the will to survive.

The interplay of the three members of the oral triad and their several emotions is evidenced clearly in the behaviour of the infant who is struggling with the pains of dentition. There are three ways of dealing with, or responding to, the problem of an erupting tooth: by sucking, biting, or crying. If the pain is only slight, the infant can maintain its defences by vigorously sucking its thumb or a dummy; this reinforces the parasympathetic half of the autonomic which, as a constant element of the feeding-cycle, tends to restore the emotional balance toward the eupeptic sleep of contentment. Oral-sucking by itself, however, can deal only with pain of minimal intensity.

The second way of dealing with a painful tooth is to bite on it. For this purpose a ring or bone or other hard object is supplied. If the tooth is not yet through the gum, biting will assist its progress. When reinforced by bouts of thumb-sucking, biting on a tooth serves to mobilize the orthosympathetic defences of the ego and helps to maintain emotional stability. The infant may fret and whimper, it may need the outside help of maternal caresses; but provided that the pain is within its threshold of tolerance, there is no actual breakdown of the ego into screaming. Homœostasis is preserved by the co-operative balance of oral-sucking and oral-biting.

If, however, the pain or other source of distress is greater than the limits of tolerance, the defences break down and disintegrate into the screams of anxiety. Neither oral-sucking nor oral-biting can now be achieved, their harmonious interaction is inhibited, and the stability of the ego is shattered. Oral-crying anxiety indicates a breakdown of physiological homœostasis.

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The problem of anxiety in the adult is more complex than in the howling infant, largely because an adult does not give vent to his emotion by oral-crying. Other avenues of discharge have to be employed when a rise of tension endangers the preservation of homœostasis.

The first response of the body to a disturbing emotion is a quickening of the heart-beat. This raises the temperature of the blood by the oxidation of glucose, and brings into play the defences against overheating, mainly an unconscious dilatation of the vessels of the skin mediated by the parasympathetic headquarters in the anterior hypothalamus. The parasympathetic thus automatically and unconsciously comes into action as a buffer to counter the first appearance of emotion. The level on which this buffering action takes place is that of thermal equilibrium. There is no threat to homœostasis at this stage and consequently no anxiety.

There is a limit, however, to the capacity of the autonomic buffer to absorb emotion at the thermal level. The emotional tension rises then to the oral zone and at this stage enters consciousness. Anger may be controlled by clenching the teeth and by the other postural actions of rage. Fear may be relieved by a good healthy shriek. Still the emotions are primary, their discharge is physiological and no anxiety has appeared.

Anxiety enters only when the oral or muscular discharge of emotion has been blocked. To take a specific instance of the discharge of emotion on the thermal level: a member of the audience at a lecture hears a reference to himself or his work. Immediately he feels a vigorous thumping of the heart, followed by racing for half a minute or more. This is the neural response mediated by the autonomic. About ten or twenty seconds later, if the emotional discharge has been above a certain threshold, he will feel an uncomfortable gripping sensation in the abdomen which is identical with the pangs of anxiety. This sensation is due to the entry into the blood-stream of a quantum of adrenalin, secreted by the adrenal glands at the behest of the orthosympathetic. The adrenalin takes a few moments to reach the abdominal vessels, which respond by contracting; it is these contractions which are felt as the visceral pangs of anxiety. Vasoconstriction in the abdominal blood-vessels raises the blood-pressure and diverts the blood from the interior towards the surface.

If the meeting had been a political one, at which interruptions are tolerated, the listener could have vocalized his emotion, and perhaps risen to his feet to protest; in which case

there might not have been the visceral sensations of anxiety, for anxiety is due to a blocking or inhibiting of the motor effects of an orthosympathetic discharge.

With or without vocalization, the heart continues to race, to generate heat, to warm the blood. This brings into action the parasympathetic defences against over-heating. The blood is diverted to the surface where it loses its heat. This may not enter consciousness, or it may cause the familiar sensation of "feeling hot all over"; a flushing of the cheeks, visible to others, betokens an overflow of the same thermostatic mechanism. After a while, the heart ceases to race, the skin no longer feels hot, the emotion disappears. The orthosympathetic discharge has been converted into heat, and has been neutralized at the thermal level by the appropriate response of the parasympathetic. Homœostasis of body and tranquillity of mind have been restored by the co-operative antagonism of the two ends of the hypothalamus.

A definition of anxiety in physiological terms may now be formulated. Anxiety is quantitatively due to aggression that has been repressed, to orthosympathetic activity (be it in rage, fear, hate or the animal responses of flight or fight) which has failed to achieve its proper motor release on account of inhibitory factors operating *from within the organism itself*. It remains now to test this formulation against the two major types of pathological anxiety, namely thyrotoxic goitre and the anxiety-neurosis that follows the practice of interrupted coitus.

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Thyroid disease manifests itself either by under (hypo) or over (hyper) activity of the gland. In hypothyroidism, myxœdema or cretinism, the pulse-rate and respiration are slowed, there is muscular flabbiness and weakness, the power of shivering is defective, oxygen-consumption and basal metabolic rate are reduced almost to one half in severe cases. Correspondingly, it is these six elements whose unnatural augmentation is so prominent a feature of the opposite condition of toxic goitre or hyperthyroidism. An early and diagnostic feature of toxic goitre, as yet unexplained, is the fine tremor tested by examining the outstretched hands. This is surely to be correlated with the reduction in the power of thermal and emotional shivering in hypothyroid states.

The six elements whose balance is upset in the polar diseases of myxœdema and toxic goitre, namely pulse-rate, respiration, muscular tone, shivering, oxygen-consumption and metabolic rate, are those which are principally concerned in the autonomic response to thermal change. The parasympathetic defence against over-heating involves a slowing of the pulse and respiration, reduction of muscular tonus, of oxygen-consumption and basal metabolic rate. The orthosympathetic defence against over-cooling operates through a quickening of pulse and respiration, an increase of muscular tonus together with shivering, an increase of oxygen-consumption and of metabolic rate.

Thyroid disease, in both its aspects of plus and minus, may be interpreted as a chronic inadequacy or breakdown of the mechanisms of thermostasis. The thyroid is one of a trio of glands which are jointly responsible for the maintenance of temperature. This is effected principally by alterations in the rate or work of the heart, which is the primary source of heat for the body at rest. The adrenal medulla (secreting adrenalins) is the short-term or emergency thermostat; the adrenal cortex (secreting cortins) responds to medium, the thyroid gland to long-term changes of temperature.

A brief chilling of the environment brings about an orthosympathetic discharge and a secretion of adrenalins, followed by a raising of the heart-rate by twenty or thirty beats a minute, with corresponding increase of oxygen-consumption and heat production. A longer drop in temperature, such as a change in weather, stimulates the secretion of cortins. Still slower alterations in temperature, such as a climatic change on moving from temperate to arctic regions, or on passing from summer to winter, increase the size and activity of the thyroid gland whose hormones (thyroxin and the other iodo-thyronins) serve as the long-term potentiator of the rate and strength of the heart.

The adrenal cortins stand, in the thermostatic team, midway between the slow-acting thyroid hormones that take up to twenty-four hours to achieve an effect which

persists for a fortnight, and adrenalin whose action comes on in an emergency and subsides after a few minutes. Adrenalectomy in adult rats decreases oxygen-consumption by ten per cent, and these rats are always hypothermic (13). Administration of cortins to such animals restores the BMR and the temperature toward normal, though in whole rats they have little or no effect on these functions. This is in line with the essentially homœostatic nature of adrenal-cortex function. There is a similarly restorative influence on the blood-sugar, which is *par excellence* the fuel for thermostasis: the cortins tend to raise the level in insulin-hypoglycæmia, and to lower it in adrenalin-hyperglycæmia (27).

In Addison's asthenia, thermal homœostasis is not greatly disturbed, and there is little or no lowering of the BMR. The patient's inadequacy is masked so long as environmental stress is absent. These patients, however, have little in reserve, and they often feel the cold acutely. Although the rate of the heart may be normal, its thermal output per beat is reduced because of the abnormally low blood-pressure against which it has to work. With a chronic deficit of circulating cortins, the heart is able to supply only the basal requirements of heat-production; it cannot rise to an emergency, whether that be prompted by an injection of adrenalin, a small dose of thyroid, or exposure to cold.

The inter-relations of thyroid gland and adrenal cortex are mediated in part through the pituitary. Hyperthyroidism is believed to cause an increased output of adrenal-corticotrophin. The gluco-cortins, which alone are concerned with heat-production, come from the zona fasciculata, whose status varies under the influence of corticotrophin; in experimental hyperthyroidism this zone hypertrophies and then shows signs of exhaustion from overwork (5). The osmo-cortins, responsible for electrolyte balance as well as thermostasis, come from the zona glomerulosa which is not under the control of corticotrophin; its output appears to be regulated by pituitary somatotrophin or growth-promoting hormone. Thus the dual role of the thyroid hormones, katabolic and anabolic, is repeated in the pattern of the gluco-cortins which promote heat-production, and the osmo-cortins which act in synergy with somatotrophin.

The thyroid gland is the principal thermostat of the body. It is against a background of thyroid activity as coarse adjustment that the finer responses to thermal change are mediated by the cortex and medulla of the adrenals.

The mechanism of the influence of the thyroid gland upon the tissues is still obscure. The following facts have been established, however, and they support the thesis that in the warm-blooded creatures its principal function is that of thermostasis, in particular as regards the orthosympathetic aspect of defence against external cold.

Among the cold-blooded vertebrates, the thyroid hormones have no influence in fishes on oxygen-consumption or heat-production (10, 19, 28); living in an isothermal environment, fishes need no thermostatic defences.

In amphibia, the thyroid has two actions, namely on growth (anabolic) and on metabolism (katabolic). The former accelerates metamorphosis and promotes increase of weight; the latter accelerates metabolism and oxygen-consumption with decrease of weight. These actions are distinct and separable. If the thyroxin molecule is acetylated, its growth-promoting influence in tadpoles is reduced by 40-fold, but it is still effective on metabolism (11). If it is deaminated (to tetra-iodo-desamino-thyronine), its activity in promoting batrachian metamorphosis is increased 130-fold (22). Conversely, dinitrophenol powerfully accelerates metabolism but has no influence on metamorphosis. The two actions differ also in their dependence on the pituitary. Thyroxin promotes the growth of thyroidectomized rats only if the pituitary is present, possibly by evoking the release of the pituitary trophic hormones (somatotrophin, gonadotrophins, adrenal-weight factor and the rest); its metabolic action, however, is largely, if not wholly, independent of the pituitary (1).

The thermostatic significance of the thyroid hormones comes out clearly in these actions in the amphibia. Thyroxin accelerates oxygen-consumption and heat-production only in terrestrial amphibia, that is, in the adult stage of certain species; it has no action on metabolism in the larval water-dwelling forms, nor in those species such as Necturus (mud-puppy) (32) which are aquatic in adult life. On the isothermal water-dwelling amphibia and their larvæ, thyroxin acts only as a growth-factor;

it has no influence on heat-production. Among reptiles, the python which lives wholly on land reacts to thyroid by greatly increased metabolism with loss of weight (15).

Similar arguments apply to adrenalin, the third member of the trinity of thermal control. This likewise is without effect on fishes (29), whereas in man a single injection will increase the BMR by 25 per cent for half an hour; this effect is stated to be absent in Addison's asthenia, and greatly exaggerated in hyperthyroid disease (35).

The inference from this sequence of observations in comparative physiology is that the thermostatic hormones act as a synergic team in the land-dwelling animals that need thermostatic control, but have no influence on oxygen-consumption and heat-production in the isothermal fishes and the aquatic forms of amphibia.

In mammals, the thermostatic role of the thyroid gland is evident. Release of thyroxin is increased by cold and decreased by heat (12, 35). Most forms of external stress cause a fall in the production of thyrotrophic hormone and a rise of adreno-cortiocotrophin, in accord with the pituitary hormone-shift of Selye's syndrome of general adaptation; cold as a stressor, however, appears to cause a shift in favour of thyrotrophin at the expense of corticotrophin.

There is a notable exception, however, in the case of hibernating mammals, in whom the thyroid gland gives a poor response to artificial cold, while the adrenals shrink instead of enlarging (6). In other non-hibernating mammals that have been tested, the onset of winter (or a cold environment) brings about an enlargement of the thyroid gland (26), and increases the total oxygen-consumption both of the whole animal and of isolated tissues (34). Warmth and summer have the opposite effects (2). How intimately are these changes related to the thermal aspect of the environment is shown by an experiment on white mice whose fur was dyed black, thereby lessening their heat-loss by radiation; the oxygen-consumption of these blackened animals was significantly lowered (31).

The site of the thyroid gland is most admirably chosen for its thermostatic function; it lies under the skin directly against the hollow windpipe, occupying a thin partition of the exposed neck in contact with air on both sides. In quiet respiration, the temperature of the tracheal air is little below blood-heat, most of the warming having taken place during its passage through the nose. The combination of cold air and increased ventilation, however, shifts the thermocline downwards into the trachea (4). The thyroid gland lies firmly bound to the upper part of the trachea just at the zone where the widest and most rapid variations of body-temperature occur with the minimum of stimulus, being brought about by increased depth of respiration as the first response to cold. There is some evidence that the activity of thyroid cells is directly stimulated by cold; it is practically certain that they function independently of neural control.

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Thyroid hormone appears to act on the body as a whole, rather than on isolated tissues. The metabolism of normal tissues *in vitro* is unchanged by the addition of thyroid hormone. The only exception to this rule concerns the myocardium, on which it has been demonstrated to have a direct action, increasing both its rate and force, and therefore its output as the chief heat-producer of the body. In explanted fragments of cardiac muscle taken from two-day-old chick embryos, that is before the appearance of nerve elements, "thyroxine exerted its typical effect on the frequency of pulsation and contractibility of such fragments, bringing about a greater increase in rate, ending in some cases in fibrillation and paralysis. These results constitute evidence that in clinical hyperthyroidism the tachycardia is due to the action of thyroxine directly on the myocardium and not on intervening nerve elements" (18). The effect was well marked within twelve hours.

In no other tissue or organ has this *in vitro* susceptibility to thyroid been satisfactorily demonstrated. This may be due, in part, to the difficulty of keeping isolated tissues alive long enough for the thyroid hormones to take effect. An isolated rabbit-heart is not affected (during its eight hours of survival) by adding thyroid hormone to the perfusate (16); if, however, the thyroxin has been administered some days before killing, the perfused heart exhibits tachycardia, and will continue to beat with an accelerated rate when fed with normal per-

fusate (16). Certain other tissues from thyroxinized animals (rats) show this port-mortem maintenance of increased oxygen-consumption; these include the liver, kidney, and respiratory diaphragm (20), all of which are secondarily concerned in heat-maintenance by supplying the heart with its fuel and eliminating its waste-products. Thyroid hormone has no influence on the oxygen-consumption of the brain, gonads and genital organs, lymph nodes, thymus and spleen (1), none of which is directly concerned with thermostasis; nor has it any accelerating effect on the metabolism of cancerous tissue (21).

It is reasonable to conclude, then, that the heart is the target-organ of the thyroid hormones. An ingenious experiment with a transplanted heart lends additional support to this view. The heart of a small dog was transplanted into the neck of a large dog, with arterial anastomosis to ensure continuity of circulation. On giving a small dose of thyroxin to this double-hearted preparation, the transplanted heart responded with an increase in rate, whereas the rate of the original heart was barely affected (24). It is not possible to attribute this sensitivity of the foreign heart to the trauma of transplantation, for injured tissues in general respond less rather than more to chemical stimuli. Although the possibility of vagal slowing of the main heart cannot be excluded, it is generally believed that this has little influence (under physiological conditions) on thyroxinized preparations; indeed, there seems to be no neural mechanism which can protect the heart from the assaults of the thyroid gland. The explanation of the small heart's response to a concentration of thyroxin which had no effect on the large heart is presumably that the small heart came from a small dog, whose ratio of surface-area to body-weight, and therefore relative thermal loss, was much greater than with the large dog. The small heart, accordingly, responded to a dose of thyroxin to which the large heart was insensitive.

The thyroid hormones act on all parts of the heart-muscle. The tachycardia of a perfused heart (from a thyroxinized rabbit) is unaltered by excision of the sinu-auricular node; it persists after crushing the auriculo-ventricular bundle, the auricles and ventricles then beating independently, each pair at its own enhanced rate (36). Later work, however, suggests that the special target may be the auricles, for these increase their oxygen-consumption by 77 per cent, against the ventricles' 22 per cent, in albino rats fed with dried thyroid powder (33).

The peculiar sensitivity of the heart-muscle, as a tissue rather than as an organ, may be related to its "astonishing versatility in the use of its fuel supply" (25). In addition to its wonted glucose, it can oxidise lactate, pyruvate, fatty acids, ketone bodies and amino acids (3).

In spite of the general belief that the thyroid gland acts as a regulator of cellular oxidation, no specific or abnormal effects on tissue-metabolism have yet been demonstrated. "The increased moiety of respiration in hyperthyroid tissue is not carried out by any new or abnormal respiratory mechanism in the cell" (20). Apart from the one instance of the embryonic heart-muscle, thyroid has been shown to act only in the whole and living animal; it works selectively on those organs concerned with heat-production, and leaves untouched the remainder. Its particular action in the cell is possibly as an adjuvant to the cytochrome system responsible for the final stage of tissue-respiration. Most pertinent hereto is the finding that human heart-muscle contains a concentration of cytochrome-C (a key factor in cellular oxidations) sixfold greater than that of any other tissue of the body (7).

Cytochrome-C is an intracellular pigment, related to haemoglobin in red blood-cells and myoglobin in muscle. The basic molecular structure of these pigments is grouped around an atom of iron, which by a reversible change of valency from the ferrous to the ferric state enables isothermal oxidations to be carried out within the confines of the cell. An isothermal oxidation liberates the same amount of chemical energy from the food or fuel as if it were burnt in a flame; but some of the energy is electronically stored in the form of "high-energy phosphate bonds", rather than being dispersed as heat which would destroy the tissues. These phosphate-bonds are then used as a primary fuel for muscular and cardiac contraction.

The enzyme which enables these almost isothermal changes to be carried out is cytochrome-oxidase. This is present in the tissues in

excess of actual requirements. Cytochrome-C is the substrate on which the enzyme works. The concentration of cytochrome-C is the limiting factor in the reaction between the two. The amount of this respiratory pigment in a tissue is a measure of its metabolic capacity or potential contribution to the thermal needs of the body. The thermal output of the heart, weight for weight, is thus six times greater than that of any other organ.

The quantity of cytochrome-C in the whole body is a measure of the total heat production. It is strikingly proportional to the surface-area (not to the weight), therefore to the hourly rate of heat loss. This correlation has been established in mammals ranging in size from rat and dog to man and cow.

Drabkin (from whose articles these facts about cytochrome-C have been taken) has come to "the unequivocal conclusion that a positive correlation exists between thyroid function and tissue cytochrome-C concentration and content"(8). Working with albino rats, he has found that complete thyroidectomy lowers the total cytochrome-C by 43 per cent; in hyperthyroid rats, the total was raised by 35 per cent, the most pronounced increase occurring in the heart. Adrenalectomy causes a reduction of total cytochrome-C by 36 per cent (9).

This brief excursion into biochemistry is necessary to establish the intimate mechanism of the thermal control exercised by the thyroid and adrenal glands, on which is based the thermal, endocrinic, autonomic theory of emotion with which this essay is largely concerned. To sum up the position: the normal function of the thyroid gland (apart from its influence on growth) may be understood largely in terms of its role as the long-term or coarse adjuster of thermal equilibrium. Disease of the thyroid gland is quantitatively manifest by disturbance of that thermal equilibrium. If the new theory of the thermal origin of emotion is correct, it is to be anticipated that a disturbance of the principal thermostat of the body will be reflected on the mental level by a correspondingly severe disturbance of emotion.

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The presenting symptom of toxic goitre is anxiety. If this disease may be interpreted as a breakdown of thermostasis, the entry of anxiety is to be expected, for anxiety invariably betokens a breakdown of homœostasis. At the thermostatic level, the physical signs of the anxiety-component of thyroid disease are so exactly those of continued over-activity of the orthosympathetic system and of the overproduction of adrenalin that it is reasonable to suppose that this over-production does in fact occur.

The relation of thyroid disease to specifically orthosympathetic emotion was emphasised by Nolan Lewis in 1925. Among the basic points in his thesis on pathogenesis is the observation that "all symptoms of hyperthyroidism, chemical, physiological and psychological, are exact duplicates of those of fear." He concluded that "exophthalmic goitre is an aggravated form of anxiety neurosis, a structuralized fear at the symbolic level" (17).

There was a notable increase of thyroid disease after the theatre-fire in Vienna in 1882, and after the San Francisco earthquake. Moschcowitz, following Nolan Lewis, repeats the conviction that "fear is undoubtedly the basis of most of the many factors that have been cited as the cause of Graves' syndrome" (23).

Animal experimentation entirely confirms these views. Wild rabbits that are confined in cages, and subject to the stress of fright from exposure to dogs or ferrets, show all the signs of human thyrotoxicosis (except actual enlargement of the gland). The microscopic structure of the gland exhibits the same proliferative changes in the cells that follow the injection of thyrotrophic hormone. The cells of the pituitary responsible for the secretion of thyrotrophin show signs of overgrowth and exhaustion. The rabbits die in a week or so, but if their thyroids are removed, they survive for months (14).

The catena of cause and effect is evident. The orthosympathetic discharge from the posterior hypothalamus, evoked by exposure to a threatening situation, would normally find its outlet in flight to safety underground. This avenue of neural discharge is blocked. The blocking comes not so much from the walls of the cage (for the frightened rabbit makes only abortive attempts at a physical escape) as from an overwhelming access of terror which cowers it into immobility. The block is partly endogenous, an inhibition of muscular activity

through terror. The post-hypothalamic discharge is driven therefore to the pituitary, causing oversecretion of thyrotrophin. This acts on the thyroid causing overactivity of the cells with all the usual symptoms of hyperthyroidism.

In hyperthyroidism, degenerative changes or signs of exhaustion are sometimes found post-mortem in the sympathetic ganglia; and the skin may show general bronzing or irregular areas of pigmentation, which suggests a disturbed functioning, presumably exhaustion of the adrenal glands. Pigmentation is characteristic of Addison's asthenia due to tubercular degeneration of the adrenals. If this interpretation should be correct, the exhaustion of the adrenal-sympathetic system may well account for the spontaneous arrest of thyroid disease which occurs in a number of untreated cases.

Toxic goitre affects a limited class of patients. In spite of its known predilection for the unstable personality, it often spares the hysterical female who gives vent to her emotions by vocalization, either talking or shrieking. In men, it is the seemingly well-integrated personality, the air-raid warden on duty, the sergeant-major in battle, who dares not yield to the terror of falling bombs and is forced to repress the natural outlet of fear, who later succumbs to thyroid disease. The onset of this disease is almost invariably preceded by months or years of continued strain, sometimes in a responsible position where the natural physiological outlets for orthosympathetic emotion have been blocked. The blockage arises primarily from within, and the repressed fear is transmuted to severe and intractable anxiety.

The ultimate emotional cause of thyroid disease has eluded detection for so long because, on the level of outward behaviour and conscious memory, the precipitating incident is not anything that the patient has actually done, but rather what she has not done, namely to relieve her pent-up emotion, whether of hate or fear, which had risen to a tensity that was physiologically intolerable.

The natural history of thyroid disease appears therefore to be as follows. There is a time of long-continued mental strain with permanent blockage of the normal outlet, at the oral level, of emotions such as fear or hate; the patient, in other words, has repressed these emotions and has failed to give them their natural outlet by shrieking, talking, or other oral activity. The orthosympathetic discharge is thus dammed up and concentrates on the adrenal glands in an effort to contain the emotion within the autonomic pool; the thyroid gland is called upon (through the pituitary) to supplement the adrenals. The heart is continually overworked, and the basal heat-production of the body is raised. After many years the disease tends to spontaneous cure, probably by exhaustion of the buffering mechanism, the sympathetic-adrenal system.

Thyroid disease is primarily a disease of the emotions. Emotions are built up on the structure of the thermal defences of the body. It is therefore the organs most concerned with thermostasis, that is, the thyroid gland, the heart, and the sympathetic-adrenal system, that are chiefly affected. And the causa causans of the emotional disease, that is, of the sustained and manifest anxiety, was a failure to give proper outlet, at the oral level, of emotions which the autonomic pool could no longer dispose of at the thermal level.

This conclusion is borne out by psychological investigations on the mental pattern of those who succumb to thyrotoxic disease. Frequently there has been found an undue dependence upon a mother or mother-surrogate, leading to a conflict between mother-love (which is unnaturally enhanced) and mother-hate (which is suppressed). The normal homœostatic balance is an equipoise between mother-love and mother-hate, mediated by the two autonomic systems in co-operative antagonism. In thyroid patients, mother-hate is suppressed for fear of losing the mother who is loved. Hate is suppressed by love; there is *endogenous* blocking of orthosympathetic discharge at the vocal or other outlets, with consequent transmutation into anxiety. The orthosympathetic emotions have no outlet other than into the vasomotor pool; the buffering-mechanism is perpetually overworked, with a corresponding overworking and hyperplasia of the tissues concerned with thermal and emotional equilibrium.

The essence of hyperthyroid disease would appear to be the continued over-activity of the orthosympathetic-adrenal system to the point of exhaustion, brought about by the unceasing psychic stimulation of the orthosympathetic at its central end, thereby dis-

turbing its homœostatic functions. In this general disturbance of homœostasis, the long-term thermostasis mediated by the thyroid gland shares as an element.

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This new concept of endogenous blockage of orthosympathetic discharge may now be applied to anxiety-neurosis. Anxiety-neurosis is a special form of neurasthenia in which anxiety is more prominent than asthenia. In a large number of cases, there is a history of faulty methods of birth-control, especially of interrupted coitus or withdrawal. So regularly is the practice of coitus interruptus followed by anxiety-neurosis that Freud, who first drew attention to the association as cause and effect, was led to postulate that anxiety is a form of lust that has failed to gain its rightful outlet. Libido, it was assumed, was quantitatively converted into anxiety. The major difficulty in accepting this view is that libido is a parasympathetic emotion mediated by vasodilatation, while anxiety is orthosympathetic and associated with vasoconstriction. There is no physiological basis for the Freudian transformation.

The further elucidation of anxiety in its relation to coitus interruptus demands a study in some detail of the structure of the orgasm and of the physiological processes that are interrupted.

The orgasm is a homœostatically balanced crisis involving the maximal discharge of both halves of the autonomic. The parasympathetic is in two parts, cranial and pelvic. The cranial outflow controls the feeding-cycle that is linked to oral-sucking lust, including the vasodilatation of the glands in the mouth and stomach and (it is believed) of the blush-area of the face. The pelvic parasympathetic or nervi erigentes, the nerves of erection, mediate the vasodilatation which enlarges the external genitals of male and female, and the relaxation of the vaginal ring which allows penetration; they carry also the protopathic sensations which constitute the forepleasure of sexual coitus. At the purely visceral level, the secretion of the sexual juices is under parasympathetic control, in symmetry with the secretion of the salivary and gastric juices at the cranial end. The parasympathetic is thus the neural basis of the threshold-stages that precede the actual consummation of intercourse.

The orthosympathetic is responsible for the visceral movements that lead to the outflow of seminal fluid. The seminal fluid is conveyed from the testes to the vesiculæ at the base of the bladder, and thence by the urethra throughout the length of the penis, by muscular contractions similar to those of the bowel. The sphincter of the bladder is closed to prevent the escape of urine into the seed, or the loss of seed into the bladder (which can happen if the orthosympathetic nerves are damaged). The sphincter of the vagina is contracted to grasp the phallos and to prevent loss of fluid. In some women the cervical sphincter makes a few spasmodic contractions at the peak of the orgasm. Accompanying these movements of the genital organs are a quickening of the heart-beat and a raising of the blood-pressure which serve, in the male, to augment the erectile power of the phallos. All these reflex actions are under the control of the orthosympathetic, which is thus the neural basis of the ecstasy that coincides with the moment of seminal ejaculation.

The parasympathetic is dominant throughout the forepleasure and up to the inception of the orgasm; from that moment the orthosympathetic takes over and controls all the local and general reflexes that constitute the actual orgasm. There is thus a sudden change of autonomic polarity which coincides with the almost instantaneous rise of emotional tension that constitutes the ecstasy of coitus.

Accompanying this change of polarity from parasympathetic to orthosympathetic is a change in the attitude of the postural muscles of the trunk and limbs, from mass flexion to mass extension. Rage in general affects the anti-gravity extensors. Lust is associated with a tendency to mass flexion. This is shown in the flexor cubitus of the infant in its mother's arms and in eupeptic contentment, and is opposed to the vague extensor movements of disturbed sleep with perhaps some visceral dyspepsia. The flexor pattern appears plainly in the attitudes and caresses of lovers in their forepleasure, when genital erection and parasympathetic vasodilatation are at their height. The general attitude of the male is one of flexion of the large joints of the hip, knees, shoulders and elbows, with contraction of the

muscles on the front of the body, in the gentler movements of sexual embrace,together with abduction or parting of the thighs in the female. When the pelvic reflexes of ejaculation commence, there is an overwhelming impulse to stiffen the back and straighten the limbs, and sometimes the arms; some males like to grasp the buttocks of their partner in movements that are both rough and painful, yet which are a source of pleasure to the female. The girl now attempts to bring her thighs together to grasp the man. Coital patterns vary widely; but a change from flexion to extension of some large joints is usually accompanied by a change of tempo from gentle to fierce which ushers in the moment of consummation.

There is thus brought uniquely into juxtaposition, at the moment of coital ecstasy, the polar elements of plus and minus at every level of physical and psychical organization. Parasympathetic tonus reaches its acme and suddenly transforms to orthosympathetic. The movements pass from the gentle caresses of the courting lover to the fierce embrace of a wrestler on his foe. The attitude of mass flexion at the same instant changes into that of extension. It is precisely at this nodal point of change of polarity at the moment of seminal emission that the orgasm is truncated by the practice of coitus interruptus.

For many years now I have been questioning my patients on the more intimate details of their sexual life in cases of anxiety, and it is clear that anxiety is due to truncation of the orthosympathetic discharge and its associated movements of mouth and body, and not of the paraysmpathetic forepleasure which is usually fully achieved. There appears to be a quantitative relation between the extent of orthosympathetic curtailment and the degree of anxiety that develops.

Should the autonomic reflexes fail to appear, there can be no orgasm. This occurs not only in impotence in the male (where there is a total failure of both parasympathetic to erect the phallos and orthosympathetic to discharge the seed), but also in priapism or maintained erection which fails to subside on account of parasympathetic over-tonus unbalanced by the orthosympathetic discharge. In the female, penetration and copulation may occur without any autonomic arousal, her body remaining a passive receptor of both phallos and seed while her mind takes little or no part in the act.

My records show that there is no correlation either direct or inverse between the appearance or non-appearance of the parasympathetic libidinal half of the process, and the appearance or non-appearance of anxiety. There is no statistical basis in clinical practice for the theory that libido transforms into anxiety. On the other hand, there is a high correlation between the non-appearance of the orthosympathetic half and the non-appearance of anxiety: if there is no orgasm stricto sensu, that, is no orthosympathetic discharge with acceleration of pulse and a greatly heightened emotional tension, there is no anxiety. Anxiety does not follow priapism in the male, nor total passivity in the female, in neither of which is there an orthosympathetic discharge. Anxiety, furthermore, does not follow the long-continued practice of coitus reservatus, where the phallos is held in position for several minutes without ejaculation, and then withdrawn and allowed to subside without orgasm. The presence of the orthosympathetic half of copulation is an essential prerequisite for the appearance of anxiety.

The relation of anxiety-neurosis to coitus interruptus may be explained as follows. The interruption of coitus by the withdrawal of the phallos does not truncate the autonomic foundation of the orgasm, for ejaculation proceeds normally (apart from location) and the orthosympathetic and perineal reflexes are carried to their wonted conclusion. The first condition for the appearance of anxiety is fulfilled. The act of withdrawal, however, involves a slight flexion of the knees and hips, it is incompatible with the straightening of the legs and the extension of the back that are the proper physiological companions of orthosympathetic activity. There is an active inhibition of the mass-extensor reflex that is an essential component of full penetration.

Anxiety-neurosis does not occur even in coitus interruptus, if withdrawal is not allowed to interfere with extension immediately following. It not infrequently happens that of two partners who for years have practised interrupted coitus, one has an anxiety-neurosis while the other remains free. The partner who is free from anxiety is the partner who has

achieved a complete orgasm in bodily extension in spite of the interruption of coitus.

* * * * *

The comparison between the structural patterns of oral and genital zones may now be completed. At both sites there is a triad of reflexes and emotions similarly related. Oral-sucking lust and oral-biting rage stand as a polar couple *vis-à-vis* oral-crying anxiety which disrupts their polarity and replaces integration by dichotomy. Oral-sucking lust is related to the parasympathetic and therefore to the threshold and forepleasure of coitus. Oral-biting rage is related to the orthosympathetic and therefore to the ecstasy of seminal emission with its accompanying motor patterns of extension and biting. The autonomic and muscular polarity at the genital zone is a mirror of the autonomic and muscular polarity at the oral zone, and the same emotions of lust and rage are brought into being at each level. Oral-crying anxiety is an inhibition of oral-biting as an outlet for, and in the presence of, orthosympathetic rage. Anxiety-neurosis follows long-continued inhibition of mass extension as an outlet for, and in the presence of, the orthosympathetic component of coitus.

Anxiety at its every appearance is a measure of physiological failure, it betokens a breakdown of homœostasis, a threat to that tranquillity whose maintenance is the primary function of body and mind. At the mouth, infantile or oral-crying anxiety ushers in the frustration-reaction and the autonomic sequels of dyspepsia. Neurotic or coital anxiety follows a long-continued frustration of the full orgasm, whose primary purpose is the maintenance both of physiological and domestic tranquillity. Thyroid anxiety follows a long-continued inhibition of the oral safety-valve of emotion, thereby damming up the orthosympathetic into the autonomic buffer, with chronic overworking of the glandular machinery of thermostasis. Anxiety in each of these cases is quantitatively due to the blockage of the oral and postural accompaniments of orthosympathetic discharge.

Summary

Orthosympathetic emotion in the adult quickens the heart and is converted into bodily heat. This is neutralized at the thermal level by the parasympathetic defences against overheating. Emotional tranquillity (homœostasis) is maintained by the thermostatic mechanisms of the autonomic. Anxiety occurs if the thermal defences fail and the tension cannot be discharged through the muscles.

A physiological definition of anxiety is given. Anxiety is quantitatively due to aggression that has been repressed, to orthosympathetic activity which has failed to achieve its proper motor release on account of inhibitory factors operating *from within the organism itself*. This formulation is examined in relation to thyroid disease and anxiety-neurosis.

A new theory of thyroid function is put forward. The thyroid is the principal or long-term thermostat of the body, against whose activities as coarse adjustment the finer responses to thermal change are mediated by the adrenal cortex and medulla. Thyroid disease is a breakdown of thermostasis, and affects chiefly the heart as the principal source of resting heat. Thyroid anxiety results from an endogenous blockage of the oral outlets for fear or hate, the post-hypothalamic discharge being diverted to the pituitary.

The physiology of the orgasm is re-stated in detail. The forepleasure is parasympathetic with flexor muscular tonus; the ecstasy is orthosympathetic with vigorous muscular extension. Coitus interruptus (withdrawal) truncates the orgasm at the instant of change-over from parasympathetic to orthosympathetic. It involves an endogenous blockage of the extensor thrust that accompanies the orthosympathetic discharge. This is quantitatively the cause of anxiety-neurosis.

BIBLIOGRAPHY

1. Barker, S. B.: *Ann. Rev. Physiol., 17:* 417–442, 1955.
2. Beattie, J., and Chambers, R. D.: *Quart. J. Exper. Physiol., 38:* 55, 1953.
3. Bing, R. J., Siegel, A., Ungar, I., and Gilbert, M.: *Am. J. Med., 16:* 504–515, 1954.
4. Cole, P.: Recordings of respiratory air temperature. *J. Laryng. & Otol., 68:* 295–307, 1954.
5. Deane, H. W., and Greep, R. O.: The adrenal cortex in hypo- and hyperthyroidism. *Endocrinology, 41:* 243–257, 1947.
6. Deane, H. W., and Lyman, C. P.: Effect of cold on adrenal and thyroid glands of hamster and rat. *Anat. Rec., 115:* 389, 1953.
7. Drabkin, D. L.: Chromoproteins and body-mass. *J. Biol. Chem., 182:* 317–333, 1950.
8. Drabkin, D. L.: Cytochrome C and thyroxine. *J. Biol. Chem., 182:* 335–350, 1950.

9. Drabkin, D. L.: Cytochrome C and adrenalectomy. *J. Biol. Chem., 182:* 351–357, 1950.
10. Etkin, W., Root, R. W., and Mofskin, B. P.: Thyroid and oxygen consumption in fishes. *Physiol. Zool., 13:* 415–429, 1940.
11. Frieden, E., and Winzler, R. J.: *J. Biol. Chem., 176:* 155, 1948.
12. Harris, G. W., and Fortier, C.: In Selye, H., and Horava, A.: *Ann. Rep. Stress, 4:* 106–127, 1954.
13. Hoffmann, F., Hoffmann, E. J., and Talesnik, J.: The influence of thyroxine and adrenal cortical extract on oxygen consumption. *J. Physiol., 107:* 251–264, 1948.
14. Kracht, J.: Fright-thyrotoxicosis in wild rabbit. *Acta endocrinol., 15:* 355–367, 1954.
15. Krockert, G.: Thyroxin and metabolism in Python. *Vit. u. Horm., 1:* 24–31, 1941.
16. Lewis, J. K., and McEachern, D.: Heart rate of thyrotoxic rabbits. *Bull. Johns Hopkins Hosp., 48:* 228, 1931.
17. Lewis, Nolan D. C.: Psychological factors in hyperthyroidism. *M. J. & Rec., 122:* 121–125, 1925.
18. Markowitz, C., and Yater, W. M.: Response of explanted cardiac muscle to thyroxine. *Am. J. Physiol., 100:* 162–166, 1932.
19. Matthews, S. A., and Smith, D. C.: Thyroid and fish metabolism. *Physiol. Zool., 20:* 161–164, 1947.
20. McEachern, D.: Metabolism of tissues from hyperthyroid animals. *Bull. Johns Hopkins Hosp., 61:* 145–179, 1935.
21. Meyer, O. O., McTierman, C., and Aub, J. C.: Thyroxin and malignant tissue. *J. Clin. Invest., 12:* 723, 1933.
22. Michel, R.: *Ann. Rev. Physiol., 18:* 476, 1956.
23. Moschcowitz, E.: The nature of Graves' Disease. *Arch. Int. Med., 46:* 610–629, 1930.
24. Priestley, J. T., Markowitz, J., and Mann, F. C.: The tachycardia of experimental hyperthyroidism. *Am. J. Physiol., 98:* 357–362, 1931.
25. Schaefer, H.: *Ann. Rev. Physiol., 18:* 207, 1956.
26. Sellers, E. A., Scott, J. W., and Thomas, N.: Muscular activity and acclimatization. *Am. J. Physiol., 177:* 372–376, 1954.
27. Selye, H., and Horava, A.: *Ann. Rep. Stress,* 44, 1953.
28. Smith, D. C., and Everett, G. M.: Thyroxin and oxygen consumption in fishes. *J. Exper. Zool., 94:* 229–240, 1943.
29. Smith, D. C., and Matthews, S. A.: Effect of adrenalin on oxygen consumption in fishes. *Am. J. Physiol., 137:* 533–538, 1942.
30. Stanley-Jones, D.: The structure of emotion. I. Lust and rage. *Psychoanalyt. Rev., 44:* 289–297, 1957.
31. Stullken, D. E., and Hiestand, W. A.: *Ecology, 34:* 610, 1953.
32. Swingle, W. W.: Thyroid and amphibian metamorphosis. *J. Exper. Zool., 36:* 397–421, 1922.
33. Ullrick, W. C., and Whitehorn, W. V.: Thyroid hormone and cardiac respiration. *Am. J. Physiol., 171:* 407–411, 1952.
34. Weiss, A. K.: Adaptation of rats to cold air. *Am. J. Physiol., 177:* 201–206, 1954.
35. Werner, S. C.: *The Thyroid.* New York: F. B. Hoeber, 1955, pp. 85, 86.
36. Yater, W. M.: Thyroxine tachycardia. *Am. J. Physiol., 98:* 338–343, 1931.

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THE STRUCTURE OF EMOTION
III. The Physiology of the Œdipus Complex

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Lust and rage are the two primary emotions. They are the integrated total response of the individual, mediated by the parasympathetic and orthosympathetic. Their province is limited by the body-surface or cutaneous boundary with the outer world. When they transgress that boundary, using the senses of sight, hearing and smell (especially sight), they are "projected" onto the objects of the outer world, the environment of the nursery. Oral-sucking lust is directed to an object, typically the mother, and becomes mother-love. Oral-biting rage becomes mother-hate. Love and hate are thus defined as internal lust and rage directed onto the mother and other objects in the external environment.

A great deal has been written on the Theory of Instincts. An instinct is an inborn pattern of reflex behavior, resident in the anatomical connexions of the cells in the central nervous system, and independent of education, example or experience. It differs from a simple reflex only in its greater level of organization: an instinct is a co-ordinated group or chronological sequence of reflexes, bearing a pattern in time. The spider spins its web by instinct, as the earwig tends its young and the stickleback builds its nest. The nesting and feeding of birds are purely instinctive. How independent of experience is shown by the fact that if a nestling has fallen out of the nest and lies only an inch on the wrong side of the edge, its mother will not feed it and will watch it slowly starve; its open mouth, being outside the nest, does not correspond to her reflex patterns of instinctive feeding. This is the biological meaning of instinct.

The term has been used also for concepts such as the sex-instinct and the instinct of curiosity in humans. Apart from the fact that sex as a word has such an immense range of denotations, to say nothing of the connotations that are grafted onto it according to individual whim and upbringing, that it is virtually meaningless unless rigidly defined, it is difficult to see any feature which human lust has in common with the reflex instincts of animals. Even if the primary emotions of lust and rage are called instincts, no one has yet applied the term to the secondary emotions of guilt and anxiety. These latter are not healthy or natural emotions, and their definition and dissection lie within the province of pathology.

Apart from rage and hate, there are other emotions that are mediated chiefly by the orthosympathetic. This half of the autonomic mobilizes the powers of the body for the "fight or flight" reaction in a nutritional emergency. In the world of Nature, to fight has chiefly the purpose of securing a meal and the satisfaction of hunger; its proper emotion is aggressiveness which is perhaps identical with oral-biting hate. Flight follows the instinctive recognition of hunger in a potential or suspected enemy; its emotion is fear. Hate then is "I am going to eat you". Fear is "You are going to eat me". The response of the stomach to these two emotions has been described in the human: in hate or aggression the stomach blushes in anticipation of a meal; in fear it blanches and the blood is used to better purpose in the muscles of escape.

Terror is not the same as an acute degree of fear. It is a total response to a gravitational emergency, and is mediated instantly by the postural muscles, only later supplemented by the orthosympathetic. It is the response of an animal falling off a tree, and is the emotional accompaniment of the righting-reflexes. The human prepares to meet a fall or an explosion by slightly flexing his limbs to take the strain. Terror causes a sensation of sagging at the knees, and there is often a flexion of the elbows and a ducking of the head. The reflex pattern of terror is quite different from the fight-or-flight reaction. Unlike aggression and fear, real terror takes priority even over severe pain. If a man in falling brings down his outstretched arm upon a burning surface, flexion

of the elbow (to withdraw the hand) is impossible until gravitational stability has been restored.

Returning from this disgression to the world of nursery: the infant at the breast builds up its images of the good and the bad mothers. When the mother and her breasts are seen, heard, felt, smelt and tasted during the pleasurable emotion of oral-sucking and the ascendancy of the parasympathetic, the total impression of all these sensations is built up into the image of the good mother. The good mother is the mother who is apprehended when the infant feels good. At other times, however, the mother is apprehended during a fit of screaming, a frustration-reaction, and the image is that of the bad mother.

The good mother and the bad mother are two entirely separate persons in the eyes of the infant. They are not regarded as two aspects of the same mother until about the age of five months after birth, for it is only at that age that the cortical cells which are responsible for visual memory are first able to function. Like Box and Cox, good and bad mothers appear always in succession, never simultaneously, owing to the all-or-none quality of infantile response in the two chief moods of its being, attached respectively to the feeding-cycle and the frustration-reaction.

A polarity thus develops between the good mother and the bad mother. The emotions onto which these visual images have been grafted are those of oral-sucking love and oral-biting hate. Owing, however, to the infant's low capacity to tolerate rage, and its tendency to break down into the frustration-reaction, the emotion linked to the bad mother is principally oral-crying anxiety. Hence it is that the vision of the good mother serves as an integrator of the ego, owing to its linkage with oral-sucking love which is part of the feeding cycle. The vision of the bad mother, on the other hand, exercises a disintegrating effect owing to its linkage with oral-crying anxiety which causes a disruption of the feeding-cycle.

The emotional life of the infant is focused on its mother. The good mother is all good; the bad mother is all bad. Until the age of five months or thereabouts there is no blending of good and bad, either as mother outside or emotion within. When the good mother is not actually within range of vision or hearing, her absence is felt as an absolute loss, a total bereavement. Having no memory, the infant has no assurance that mother will ever return. With the infant thus bereft of its principal source of security, it takes only a minimal disturbance to set in motion the frustration-reaction, and with it the reflexes and emotions onto which have been grafted the image of the bad mother. Disappearance of the good mother thus comes to be associated with the emotions proper to the bad mother; and by the process of "conditioning", that is, a temporal sequence of one reflex upon another and which is the basis for the child's notions of cause and effect, the bad mother is believed to have caused the disappearance of the good mother, or to have destroyed her.

The good mother suffers certain handicaps in contrast with the bad mother. Her image is visual, and until memory develops it cannot be retained. Her oral reflex is sucking, and this is not a spontaneous response to hunger but is brought about only by stimulation of the lips. An infant cannot suck at nothing. When it discovers, however, that its thumb will serve as a nipple-substitute to start off its sucking-reflex, it can restore part at least of the influence of the good mother, and allay its fears of her total loss. With the setting in train of an artificial feeding-cycle paced by the oral-sucking of the thumb or a dummy, the parasympathetic gains the ascendance and the infant falls asleep. The advantage of a dummy over the thumb is that the thumb cannot be sterilized by boiling; on the other hand, the thumb is under the infant's own control whereas the dummy is not. Both should play their part in the nursery, and the belief that thumb-sucking causes adenoids is a pure myth.

The bad mother is associated with oral-biting and thence with oral-crying. This latter reflex is brought into being upon the slightest provocation, and there is a constant tendency for the image of the bad mother to rise up whenever it is not actively neutralized by the vision, that is, the real presence of the good mother, or by the mother-surrogate induced by thumb-sucking. The good mother is transient because she is dependent upon a visual image which cannot be retained in full, and even her oral reflex needs an outside stimulus, it is not spontaneous. The bad mother is

grafted onto oral-biting and oral-crying into which there is an ever-present risk of relapse. Moreover, oral-crying anxiety and the frustration-reaction are structurally self-exciting and have the kybernetic properties of a runaway.

Thus it comes about that the earliest months of life are dominated by the image and the reflexes of the bad mother. No matter how good the real mother, she is handicapped by the physiological structure of her infant's mind and body. Her constant real presence during the first few weeks of breast-feeding, and the immediate relief of oral frustration by timely application of the nipple, no matter what the hour of day or night, will serve to potentiate the parasympathetic and its ancillary responses at the expense of the orthosympathetic and frustration-anxiety. The pernicious habit of separating a mother from her new-born child which obtains in most hospitals and some nursing-homes has nothing to recommend it but administrative convenience, and leaves in its train a physiological imbalance in favour of anxiety.

In the mind of the infant during the first few months, the good mother being visual is conceived as living in the outer world; whereas the bad mother, grafted upon the reflexes of biting and crying, is regarded as internal. The bad mother, moreover, is associated with the dyspeptic sequels of frustration, she can actually be heard rumbling within and felt as a colicky pain. The passing of flatus with relief of colic (a parasympathetic reflex, therefore linked to the good mother) is thus phantasied as an expulsion of the bad mother within.

The good mother, however, also has her internal counterpart in the taking in of the hot milk, and in the deep sensations of swallowing and gastric warmth. The phantasy (not necessarily visual) is thus built up of the good mother within. The process whereby the infant takes in or incorporates the vision of the good mother is known as introjection; it is a physiological association of an image with a visceral sensation, a grafting of a real vision upon a substrate of alimentary reflexes. There is thus a definite physiological basis for the concept of the good mother within. The relating of the internal, visceral sensations to the external presence of the real mother is the same mechanism in reverse, and is known as projection. Projection and introjection are mental processes, and come to assume some importance in the development of the earliest strata of the mind.

The deepest layers of the unity which is the mind and body are phylogenetically the earliest layers. Of the many strata that enter into the primary emotions, the oldest is the autonomic response to change of temperature. Upon this are laid the unconscious processes connected with the stomach and digestion, and then the conscious processes of sucking, biting and swallowing. The vasomotor and visceral levels must therefore be regarded as more primitive, more fundamental, than the oral reflexes which have been grafted onto them.

The autonomic substrate of the bad mother is the orthosympathetic, and her oral reflexes are both oral-biting and oral-crying. Oral-biting is known, from experiments on decorticate animals and sham rage, to be closely associated with a massive discharge of the orthosympathetic; oral-crying in the human is accompanied by a quickening of the heart, a raising of the blood-pressure, and other signs of orthosympathetic activity. Oral-biting enters into a balanced antagonism with oral-sucking: it is not therefore an influence making for disintegration. Oral-crying, however, causes a disruption of the feeding-cycle and predisposes to dichotomy.

The disintegrating aspect of the bad mother within is associated with oral-crying and anxiety, rather than with oral-biting and hate. Hate by itself does not cause dichotomy. In spite of this, however, the inability of the infant to tolerate more than a certain quantity or intensity of hate leaves it with an ever-present risk of a runaway into frustration whenever that threshold of hate is exceeded. Oral-biting hate when undischarged overflows into oral-crying anxiety.

It is the oral-biting aspect of the bad mother that enters most vividly into the phantasies of infancy. In the dreams of adults and in the games of children, there is an infinite wealth of symbolism all with the basic understructure of oral-biting. A large number of symptoms and phantasies can be traced to this cause. A phobia of biting dogs or scratching cats, a horror of scissors, knives and cutting-instruments in general, the useful habit (albeit

obsessional) of picking up pieces of broken glass on the beach, in these and countless others the emotional element of the phantasy is due to the image of the bad mother within, while the biting or cutting element is traceable to the accompanying oral-biting reflex.

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The powers of memory develop with the maturation of certain association-areas in the cerebral cortex. The time of five months after birth may be taken as a notional age at which this process is well on its way. The infant can now carry a visual image of the real good mother to sustain it during her absence, and this greatly helps it to maintain its emotional stability and to overcome the destructive assaults of the bad mother within.

This overlap of the good mother into the province of the bad mother brings with it new problems in emotional development. Psychological conflict replaces the pattern of all-or-none, of all-love or all-hate. The infant recognizes that the bad mother whom it hates is the same person as the good mother whom it loves. It recognizes furthermore that the good mother whom it loves, and who is its only source of security, is also one whom at other times it has hated. This conflict of love and hate, played out in the person of the real whole mother against a background of imagined part-mothers (the good and the bad), is a major crisis of infancy. Upon the solution of the conflict will depend the course of its development as a child and the set of its character as an adult. The crisis may therefore well deserve the name of formative crisis.

The best solution of the conflict of the formative crisis is unhappily the rarest. The infant ideally should learn not only to recognize that it sometimes hates its good mother, that is its real mother; but also should learn to accept the fact and not to deny it. To accept, that is, that I the all-perfect baby with the all-perfect good mother (such is the pattern of infantile thought) actually hate my all-loving mother, and I must learn to accept the possible consequences, which are that my mother will sometimes hate me in return. I must give up my phantasies of perfection, for I see now that neither I nor my mother are as perfect as I thought they were. Mother is sometimes going to hate me, to be angry with me and punish me, and it is the good-bad mother, my real whole mother, not the bad mother alone, who is punishing me. I too am no longer perfect, for I sometimes hate my mother and therefore am hateful myself. I must accept both myself and my mother for what we really are, both of us real people who when divested of phantasy are both good and bad together.

It is rare indeed for even an adult to have reached this ideal stage of maturity. There are few men and women at any stage of the world's history who have been able to view themselves and their neighbours as real persons, undistorted by the phantasies of infancy. Every man has a preferential tendency to see the good things in those whom he loves, in his friends and fellow men of whatever social group or political party or church he may call his own; and conversely to see more bad than good in those whom he dislikes, and in those of a differing complexion. It is few indeed who can recognize the real merits of their personal enemies, and the real demerits of those whom they cherish as friends.

There is only one solution to the conflict of love and hate. The infant, the child, the adult must accept the emotions of its own love and hate when directed simultaneously to the same loved and hated object which is the mother and all who come to be grafted onto her image. This is the only solution which follows the normal physiological pattern.

Love is the emotion of the parasympathetic; hate of the orthosympathetic. The two halves of the autonomic work together in health, as a polar couple of balanced antagonists, to maintain the stability of the body. Their corresponding emotions similarly should work together as a polar couple of balanced antagonists to maintain the stability of the mind. There should be no question of love overcoming hate, or of banishing hate, any more than the parasympathetic should attempt to overcome the orthosympathetic, or oral-sucking to banish oral-biting. Rather should each item in one rank (the love, the parasympathetic, the oral-sucking) learn to accept and to work in full harmony with its opposite number (the hate, the orthosympathetic, the oral-biting) in the other rank as well as with all the members of its own team. Love should be linked to hate as an inseparable couple.

There are many alternatives to the phys-

iological solution of the formative crisis. Each is the result of some sort of failure at one or other level of the personality. There is first the solution which perpetuates the emotional position of infancy, which is a separation in time: love and hate appear in succession and never simultaneously, like the folk in the cottage barometer. This, the early-infantile solution, determines the personality in the all-or-none pattern, all-love at one moment, all-hate the next. So common is this pattern in childhood that it can hardly be regarded as abnormal.

A second solution separates love from hate by directing them always toward different objects: a separation in space. The mother is idealized as an all-perfect mother. All good things in life, all who later come to occupy a position corresponding to the mother or her surrogates, are grafted onto the image of the all-perfect good mother, as though by a process of crystallization of like upon like. No friend is ever aught but an all-perfect friend, and so the chill touch of reality brings about frequent disillusion. Specially is this true when, as so often happens, a man idealizes his wife as once he idealized his mother. He discovers sooner or later that his all-perfect wife is a phantasy of his own creation, and then disaster is imminent. The other side of the picture, the side of life which is not in series with the all-perfect mother, is bereft of that due measure of love which should be all-pervading; it is informed therefore with an undue measure of surplus hate, unbalanced by love.

The separation of love from hate by projection onto different objects in the outer world is the solution so universally adopted during early childhood that it is almost invariably regarded as normal, if not indeed an inborn or constitutional pattern. Physiologically, nevertheless, it is unnatural. In this solution, the real mother retains her good aspect and the love that goes with it, and the bad mother is forgotten. The hate, now unattached, has to seek some other outlet.

From its earliest years a child can sense the difference between male and female. It has no difficulty in grafting its impressions of nurse, sisters, aunts onto the image of its mother, and investing them with the complex of emotions attaching thereto. Brothers, uncles, and males in general fall into line with father. Father comes early to occupy the opposite pole in the firmament of the nursery from mother. Onto him therefore is shed the load of oral-biting hate that can no longer remain attached to the mother.

This is the Œdipus situation. It has its roots in the oral reflexes and the primary emotions of love and hate. The idealized mother retains her full measure of oral-sucking love, while oral-biting hate is directed toward the father as the polar object from the mother. In a happy home the Œdipus situation, in spite of its physiologically unnatural foundations (for parasympathetic can never be divorced from orthosympathetic), is brought to some sort of a solution by the circumstance of external events. If father and mother are truly in love, then hate is once more reconciled to love in the persons of the real parents. It is a second-best solution, resting upon external rather than internal foundations. Its success lies principally in relation to the outer world: it promotes external adaptation at the cost of internal harmony.

The Œdipodal situation is the result of an inability to tolerate love and hate in conjunction. It issues from a failure at the formative crisis of five months, when the cortical cells of visual memory first take on their neural functions. It has its roots in infancy, in the reflexes at the oral level, and in analysis it can never be fully resolved apart from an exploration of the oral layers of the mind. It leaves in its train a series of physiological disharmonies whose diagnosis and treatment occupy a large part of the new science of psycho-somatic medicine.

A disharmony of the oral pacemakers of the feeding-cycle leads to an unsteadiness of autonomic control of almost every subsequent stage of digestion. Chief among the sufferers from the oral imbalance of the Œdipus complex are the sphincters of the stomach and the bowel; disharmony here leads to various forms of gastric indigestion and constipation. Many of these seemingly bodily complaints are due in the first instance to psychological trouble at the oral or Œdipodal level, and physical treatment should be accompanied by deep analysis which aims at replacing oral conflict by co-operation. In spite of the psychological basis of the oral conflicts, and the fact that the Œdipus situation was discovered by purely

psychological means, it should be regarded as a physical, physiological conflict which can be fully understood only by interpretations on physiological lines. It is therefore to the physiology and anatomy of the autonomic that attention must be directed, in order to follow up some of the further consequences of the Œdipus conflict.

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The autonomic system is developed in relation to the three embryological sections of the primitive gut, namely the fore-gut, mid-gut and hind-gut. The central section is orthosympathetic, the end sections parasympathetic, known also as the cranial and pelvic (sacral) outflows. The cranial end of the parasympathetic is concerned with the feeding-cycle. The pelvic parasympathetic is concerned with the lower openings of the body, with defæcation, urination and genital congress. It causes vasodilatation of the blood-vessels of the penis and clitoris, whence the alternative name of nervi erigentes (the nerves causing erection).

The pelvic reflexes of bowel and bladder are not amenable to conscious control during the earlier months of infancy. The opening and closing of the sphincters, and the other mechanical movements necessary for evacuation, are subject only to unconscious neural centres at the lower end of the spinal cord. By the time the child is two years old, full conscious control of the sphincters has usually been achieved. The same time-table of development of neural control is followed by the genital reflexes. Somewhere between the ages of six months and two years, the male penis becomes capable of voluntary erection, and genital sensations of a protopathic nature arrive in consciousness.

The same phase of childhood sees important changes of structure in several other bodily and mental mechanisms. The child's intuitive awareness of the difference between male and female develops at this time, and the boy in his phantasies will unconsciously furnish his father with a penis similar to his own. There is no need to postulate an inherited knowledge of sexual anatomy, as some psycho-analysts wish to do, although there is no real reason why this postulate could not be true: mental patterns of thinking are known to be inherited just as are bodily patterns of growth. The chief argument against it is that the boy has no inherited knowledge that his mother and sisters are without a penis, and a corresponding ignorance is found in the girl. There are many instances on record of actual psychological trauma or mental injury having resulted from a discovery of the facts of sexual anatomy in untoward circumstances. This "trauma of the bathroom" has been held to account for the castration-complex.

These months from six to twenty-four witness also the Œdipodal partition of hate from love. At the mental level, hate is transferred to the father as the polar object from the mother. This transfer bears no relation to the real merits or demerits of the father as a living parent. The immediate sequel, however, is largely influenced by the facts of the external situation. If the father in real life is cruel, and deserves the mother-hate which has been transferred onto him, this hate will remain in consciousness, and a permanent enmity will grow up between father and son. Even if the father is imagined as cruel, or is represented as the source of punishment by a foolish mother who is jealous to preserve the mother-love still left to her, the child will feel that its father-hate is justified: some of it at least will not therefore be repressed.

In happier homes, however, the father appears as a protector rather than as a punisher and frustrator. Father-love is based on a real situation and is sufficiently powerful to banish from consciousness the father-hate for which there is little or no justification. It is the repressed element of this father-hate, formerly mother-hate, and incompatible with real father-love, that forms one of the elements of the castration-complex.

The transfer, at the mental level, of mother-hate to the real father is accompanied by corresponding events in the realm of the body. The physiological explanation in terms of sphincters is not yet fully understood, but there is abundant evidence from every deep analysis that the following sequence of events takes place about this time.

Of the two elements of the oral-biting hate which has to be separated from oral-sucking love, the hate is transferred from mother to her polar object the father; the oral-biting is displaced (in phantasy) from the mouth to

the pelvic orifices. It is the genital part of this displacement that enters into the castration-complex. The physiological basis of castration-fear is a disturbance of the autonomic balance of the pelvic reflexes, especially the genital, unduly in favour of the orthosympathetic.

The need for the isolation or protection of oral-sucking love as the substrate of the idealized mother, consequent upon the failure at the formative crisis of five months, is reinforced by the pains of dentition. The teeth start to erupt at about four months, and continue in crops of four until the end of the second year. Biting is now associated with actual pain. Some of this pain is tolerated, and the cutting of teeth is helped by mildly painful biting on a hard object. At other times the pain is too great, and oral-biting hate, exceeding the threshold of tolerance, overflows as oral-crying anxiety. This in itself aids the process of displacement of hate, which is the cause of the anxiety, from the oral to the pelvic zones, in order to relieve the tension and pains of teething.

The frustrations of weaning should never be allowed to add to the infant's difficulties of teething. In view of the importance of oral-sucking love as the substrate of the good mother within, who is the principal integrator of the ego, breast-feeding should always continue for at least five months. From this time onward the visual memory of the real mother serves increasingly to supplement and replace the oral and visceral elements, unremembered, which previously have supported her image.

Weaning should be regarded in its true (etymological) sense of accustoming to, rather than separation from. It is an accustoming to the cup and the spoon rather than a separation from the nipple; an accustoming to solid food demanding oral-biting. The greater the tolerance for oral-biting during feeding, and the more it is exercised in co-operative antagonism with oral-sucking, the less will be the need for displacement of its surplus to the pelvic zone. For this reason weaning should be attempted only during a phase of high tolerance, and avoided at those times such as illness and teething when the threshold of tolerance is reduced. A satisfactory weaning lessens the anxieties of the castration-complex.

The need to shed the load of surplus oral-biting hate, aggravated by the difficulties of weaning and teething, is the vis a tergo. There is, however, a vis a fronte which preferentially attracts the unwanted oral-biting hate to the genitals. First, there is the entry of genital sensations into consciousness during this time (the phallic phase of childhood). Secondly, there is the probably unconscious assumption, or realization, that father and son both have a penis. The male organ thus comes to be associated with father, or to represent father in unconscious phantasy. It specifically attracts, therefore, the oral-biting hate which has already been linked to father on the mental plane and in real life. The constellation of phantasies which are supported by this partly hypothetical reconstruction of physiological events is known as the castration-complex.

Castration is not a good name, for it means, surgically, the removal of the testes. These, being without protopathic sensation, do not enter into the life of phantasy. In psychoanalytical parlance, castration refers to the imagined amputation or loss of the penis. The child fears that its father will cut off its penis: when the deeper layers have been revealed, the manner of cutting off is found to be by biting with the teeth. At a still deeper level, reached only after prolonged analysis, castration-anxiety is a fear that the penis will be bitten off by the mother. This discovery can be illustrated by a case-history.

A school-teacher started analysis with me at the age of 31. His presenting symptom was severe depression on the thought of severance of his friendship with a young schoolboy with whom regular homosexual intercourse was taking place. In addition to the depressive element in his make-up, it was evident that he had morbidly obsessional traits with a general personality-structure of a pre-paranoia. The Œdipodal partition of hate from love, on the superficial plane, was represented by his homosexual attachment to the admiring schoolboy as a substitute for his mother. A fear of discovery by the authorities symbolized the vengeful and hated father.

The analysis uncovered a memory at the age of two-and-a-half when an attack of diphtheria co-incided with the arrival of a baby brother. The patient had been isolated, nursed by strangers and cut off from all his wonted sources of security. This isolation, continued for several weeks, proved to be

traumatic, and was aggravated by the loss of priority in his mother's affection in favour of the new arrival.

The oral-biting element of the castration-complex came to the surface in several phantasies. During adolescence he had often played with the idea of stabbing other people with a dagger which had large serrated teeth like a coarsely fashioned saw. While under analysis, he had an almost uncontrollable outburst of temper on discovering that his favourite pencil had been borrowed by a colleague, who had bitten the end as writers often do and had left his tooth-marks on its polished surface. The dagger and the pencil were thinly disguised symbols for the phallos, and the saw-teeth and tooth-marks reflected the displacement of oral-biting hate onto the genitals. Interpretation on these lines gave some relief to his difficulties and enabled him to enter into better relations with his father.

The patient had been circumcised during infancy, and it was believed that this had taken place at the age of six months. The memory of this was brought into the analysis after an incident in which he had tied up his schoolboy friend with outstretched arms, and played about with the boy's erect penis, pretending to bite it off. The patient himself interpreted this in terms of castration-anxiety, and suggested that the incident was an acting-out of his own circumcision when his mother had held out his arms while the doctor operated.

Interpretation of the doctor as the castrating father failed to bring relief. The progress of the analysis was held up until the patient produced a series of intensely vivid phantasies illustrating various aspects of repressed mother-hate. Firstly, the mother was vested with the serrated dagger as a male organ, and entered his phantasies as "mother with the dagger penis". This revived a memory of childhood when the real mother in an outburst of temper had seized his doll and bashed its head against a bed-post. This most distressing incident gravely shattered the child's sense of security, as the doll represented his penis, and the real angry mother reactivated the repressed phantasy of the bad mother. The attack by the bad mother on the doll as penis-symbol was a re-enactment of his trauma of circumcision. He recalled the memory of her in the act of bashing his doll, with her teeth bared and clenched in her anger. The mother-with-the-dagger-penis was now replaced by an earlier memory of mother-with-the-gnashing-teeth.

Interpretation of this phantasy as a union of oral-biting hate with the infantile memory of the bad aspect of his mother enabled him to overcome a long-standing and severe phobia of dogs. On many occasions as an adult he had flown into an acute anxiety-attack, of psychotic intensity, on being approached by a barking dog, whose bared teeth revived the painful phantasies from the early levels of the mind.

The mental structure underlying the homosexuality was related to the union of oral-biting hate and the penis. The patient was barred from heterosexual intercourse by an unconscious fear of injuring his mother, or her substitute in a sexual partner, with his mutilated dagger-penis. The friendship with the schoolboy afforded an outlet for his physical lusts without activating this phobia of intercourse. During the progress of the analysis, homosexual practices were abandoned, homosexual phantasies were replaced by heterosexual, and in due course the patient contracted a happy and stable marriage.

In spite of the successes attending these deep interpretations, certain features of the patient's mental illness remained untouched. The tendency to depression, the bondage to obsessional practices, and the paranoid elements of his character resisted all attempts at therapy. It was evident by now that the early trauma of circumcision was the nodal point of his illness; but working through this position from many different angles failed to make any impression.

It was at this stage of the analysis that the patient was able to have a sight of his mother's diary, to check the exact date of his circumcision. It was then discovered, to our joint amazement, that the operation had taken place, not at the age of six months as we had thought, but at the age of ten weeks, on the seventieth day after birth. This new information enabled the material to be re-interpreted in the light of the known physiology of that age, when oral-sucking is much more prominent than at the later date.

One of the results of interpretation on mainly physiological lines, involving the

balance of oral-sucking and oral-biting, was a change in the patient's attitude to spiders. These creatures, he knew, both bit and sucked their prey, and he regarded them with a mixture of fascination and horror; his attitude, that is, was ambivalent, an inharmonious balance of love and hate. After the analysis of this attitude in terms of the oral reflexes of infancy, his ambivalence was replaced by a genuine scientific interest. Many other aspects of his character changed in the same way.

Further deep interpretations were given on these principles, in which the element of oral-sucking was given greater prominence than it had been when patient and analyst were working, as they thought, at the level of six months. These interpretations enabled the last psychotic residues to be satisfactorily cleared up. The paranoid aspects of his character were brought sufficiently under control to enable him to live, for the first time, at peace with his colleagues and social contacts. The recurring depressions ceased, and the symptom of anxiety from which he had suffered since early childhood left him entirely. He claimed, and probably truly, that he lived now completely free of anxiety.

It is not often that an analysis of a patient with psychotic character-traits can be brought to so successful a conclusion. Paranoia and homosexuality are notoriously refractory to treatment of any sort. The degree of repressed hate that underlies the paranoid disposition, and which must be fully brought to the surface before a cure is effected, is so intense that many analysts counsel against treatment of a paranoid patient on the grounds of physical safety. It is unlikely therefore that this case would have responded to the conventional method of transference-therapy, in which the patient transfers to the analyst the hates and loves of his childhood or infancy; for the emotions attached to the mother at the age of ten weeks are so intense and so uncontrollable that, were they re-enacted between patient and analyst in their adult capacities (which is the essence of the transference-situation), their intensity would probably have been dangerously overwhelming.

A further difficulty arises in connexion with the phenomenon of resistance. There is a certain difficulty in recovering the memories of childhood which is not due to mere forgetfulness; the memory has been actively repressed rather than passively forgotten. The overcoming of the resistance of the forces making for repression, and the analysis of the repressing forces themselves as well as the memories that have been repressed, occupies a great part of psycho-analytical therapy. This difficulty, great enough in recovering the emotions of the Œdipus complex at five years, becomes far greater in the analysis of the pre-Œdipus years, and is well nigh insuperable in exploring the first twelve months, the year of infancy.

The trauma of circumcision at the age of ten weeks is the earliest known incident in a patient's history that has yet been reported in the literature. Its successful recovery led to the cure of two diseases which are virtually incurable, namely homosexuality and paranoia. The technique used in this analysis may therefore be of interest. No attempt was made, for the reasons just given, to establish a transference-situation. Nor was there any direct encounter with the resistance at this level: instead of overcoming the resistance, it was circumvented.

Just as there are two ways of stroking a porcupine, so there are two ways of conducting an analysis of a human mind. These two ways may be called retrograde and anterograde. Retrograde analysis is the conventional method, which is also that used by the archaeologist. Layer after layer of experience is carefully uncovered and sifted, starting with the most recent and superficial, gradually working down to the deepest and earliest.

A necessary part of this technique is the analysis of the transference-situation, that is the situation that arises between analyst and patient as the emotions laid bare by the process of uncovering attach themselves to the person of the analyst. These emotions are the memories of childhood in which mother-love and mother-hate are the two dominant poles. They cannot be left in mid-air, and they must be re-attached to some other person before the anxieties of their discord can be relieved. The analyst, in other words, has to play the role of mother and father to his patient who is reduced (in the analytical situation) to the emotional status of child or infant. The analyst onto whom are transferred these polar affects of love and hate has to harmonize, in the unity

of his person, the dichotomy between the emotions which is the cause of the patient's anxiety.

The necessity for the transference-situation in retrograde analysis is determined by the anatomy and physiology of the cortex. There is no physiological explanation, however, of the resistance which invariably accompanies it, and it is possible that the whole phenomenon of resistance is nothing more than an artifact of technique. It may be that retrograde analysis involves the working backward from later to earlier experience, which is contrary to the natural course of events.

Resistance does not arise in physiological or anterograde analysis. Neither are the difficulties of the transference-situation encountered. The interpretations given in anterograde analysis seek to explain to the patient the physiological basis of his emotions of love and hate, referring them to the oral reflexes of his own body, and to the person of his real mother in the past or her present-day surrogates good or bad, rather than attempting to create the wholly artificial emotional relation between two adults which is the transference-situation. Deep interpretation, when it can be correctly made, meets with little or none of the resistance provoked by retrograde analysis; for the interpretation is from below, that is from before in the course of time. Anterograde analysis appears to be physiologically the correct method of dealing with difficulties caused by misplaced and unbalanced emotions.

This case-history has been recounted in order to illustrate the importance of mother-hate and oral-biting in the genesis of castration-anxiety, which hitherto has always been regarded as due primarily if not solely to father-hate. The transference of oral-biting hate from mother to father (which is the essence of the Œdipus complex) and its displacement from mouth to penis (which is the essence of the castration-complex) are both caused by physiological, that is bodily rather than mental determinants. The same physiological factors determine the displacement, in the dreams and phantasies of many patients, of oral-biting hate to the female genitals.

The motif of the vagina dentata is of frequent occurrence in analytical work. There is a conjunction of two sets of images in the same dream, one set symbolizing the vagina, or womb, or maternal organs in general, the other set symbolizing teeth, or biting, or aggression. A combination of phantasies such as this is one of the causes of impotence, masturbation and homosexuality: the patient is afraid of intercourse per vaginam, and hence with females as a class, as unconsciously he fears that the female organs will injure or bite off his phallos. When dreams and phantasies of the vagina dentata can be interpreted on these lines, the anxiety associated with them is reduced and the clinical symptoms are relieved.

Further evidence of the displacement of oral-biting hate to the female orifice comes from philology. The Greek word *kteis* (genitive *klenos*) means a comb, that is something with teeth; also a rake or harrow in which the teeth are more in evidence, and the spread-out fingers which branch like the teeth of a comb. The etymological root *kten* is also that of the verb *kteino* (future *kteno*) to slay or kill, especially of fellow-men, only rarely of animals. Here there is the primary conjunction of oral-biting with aggression. The displacement to the pelvic organs appears in the use of the same word *kteis* for the female genitals, and more vividly for a cockle or scallop. This bivalve shell-fish when open under water presents two extruding mantles resembling the vaginal labia, enclosing the gills which look like a comb or a row of teeth.

The whole complex reappears in Latin. *Pecten* (genitive *pectinis*) means a comb, a rake, and a clasping of the hands as in distress; it means also the pubic hair, and the scallop (which is the use familiar to biologists). *Pectus, pectoris* is the breast on which the infant first bites the flesh of its mother.

Latin and Greek cannot fairly be cited as independent sources, in view of their frequent borrowings and their common relation to Sanskrit. The Latin series reproduces the two principal consonants k and t of the Greek, while the initial p may come from the Greek *pekteo* to comb, to card wool, to shear or clip, in which the senses of teeth and biting (cutting) are joined.

In the case of Anglo-Saxon, the same conjunction of good mother, bad mother, sexual congress and shell-fish has been reached, apparently from quite a different starting-point. Queen is the universal good-mother symbol, never more so than at the present time. Quean is a harlot, the bad mother. Both words (Anglo-Saxon *cwēn* and *cwene*) are cognate with the Greek *gynē*, *gynaikos* a woman (whence gynaecology) in the sense of a married woman, wife or concubine, or the mate of animals; the emphasis being on fertility, having its origin in *gignomai* to be born. A phonetic variant quin is the sailor's name for Pecten opercularis, the gaily coloured lesser scallop which swims about in shoals by actively flapping its shells in the motion of biting.

Yet another variation on the same theme is Pecten Veneris, Pliny's name for the Venus' Comb. This is a common weed in English cornfields, and its row of sharp needle-like seed-pods looks like the teeth of a comb. Venus (Veneris) was worshipped not only as the goddess of Beauty but also of sexual love, a sense that is preserved to her honour in the words venerable and venerate, but degraded by the current usage of venereal. Here again is the combination of a row of teeth with the sexual aspect of womanhood. The notion of sexual coitus (implied in both gynē and quean) reappears in the modern names for this plant: needle-weed, Adam's needle, beggar's needle, shepherd's needle (needle, be it noted, always in the singular, in spite of the row of needles in the pleural), needle being a folk-name for penis.

This complex of primary notions—hate and love, father and mother, male and female, penis and vagina, biting teeth and sexual coitus—runs through many themes both of folk-lore and physiology. The psycho-mythology of the English countryside is a field of study more rewarding even than the myths of the ancient world; for this presents a still-living phenomenon, current in native speech, instead of stories and fables enshrined in the literature, whose interpretation can now be only a matter of conjecture.

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Oral-biting hate is displaced to the other pelvic muco-cutaneous junctures, as well as to the external genitals. The latter displacement is certainly physiological and normal, but anal-hate and urethral-hate are possibly the abnormal results of unwise attempts at training in cleanliness. It is true that a stage of "anal sadism" and "urethral sadism" has been disclosed in the life-story of every patient whose analysis has been extended to the early layers of the mind. This, however, does not necessarily imply that they are normal phases of development in the sense of being universal, still less that they are normal in the sense of optimal or physiologically healthy. Doubt arises on account of the method of sampling. Only two classes of the population have been analysed down to this level: children and adults who are in such grave psychic difficulties that both analyst and patient consider it worth while to spend an immense amount of costly professional time in reaching into the depths; and candidates in training for psycho-analysis who enter this branch of medicine more as a vocation or call to which they must respond rather than of free choice. It is possible that their choice of calling was determined by the mental disquiet engendered by these deeply buried emotions.

The physiologist can give a good account of the displacement of emotion from the oral to the genital zones, which issues as the Œdipus complex and castration-fear. He is at a loss, however, in his search for even the beginnings of a clue to explain why the oral emotions should be displaced to the anus and urethra—a clue, that is, which depends upon the ordinary and natural physiology of infancy and is independent of unnatural environmental influence. It is possible that this "stage of maximal sadism" that obtains from six to twelve months of age is a pathological diversion from natural development, the price that modern infants have to pay for the privilege of being civilized. Abnormal anal and urethral elements seem to be absent from the mythology and folk-lore of native races who are not trained in unnatural habits of cleanliness.

The explanation of the Œdipus complex which was put forward by Freud, although different from that given above, is not incompatible with it. In brief, the child lusts after its mother and desires sexual or genital intercourse with her, but he senses that this is

forbidden on account of the prior claims of its father as husband. The father therefore becomes the frustrator, and in phantasy punishes the child for his mother-coitus wishes by cutting off his penis. Such is the external explanation in terms of the triangle of the nursery. Structurally it is the same as the internal or physiological explanation in terms of the oral reflexes and transferred mother-hate. There is, accordingly, a resonance between internal and external situations which allows the interpretation of the one to be effective in respect of the other. Anterograde interpretation of the inner or physiological situation lessens the anxiety of the outer situation; retrograde interpretation by conventional analysis of the Œdipus situation ensures a greater stability of the physiological processes of which the oral reflexes are the pacemakers.

Internal dichotomy between oral-sucking lust and oral-biting rage is reflected in the external dichotomy of the Œdipus conflict between mother-love and father-hate. From this nuclear position the effects of the dichotomy may be traced in both directions. Within, oral imbalance is followed by failure of autonomic co-ordination at one or many of the sites of meeting of parasympathetic and orthosympathetic. The sphincters or ring-muscles of the alimentary canal and pelvic openings are frequently affected, being either too loose or else closed in spasm; diarrhoea, constipation, bed-wetting in children, dyspepsia in men and vaginal frigidity in women are among the many symptoms of visceral dichotomy.

The newly rising science of psychosomatics concerns itself largely with those organs and tissues which are the possible sites of neural disharmony, being innervated by the polar network of the autonomic. The truth is slowly being realized in medical circles that many visceral diseases, seemingly purely of the body, are psychogenic in their origins and cannot be cured without a therapy of the mind. The therapy is most successful when it aims at reducing tension or psychic conflict, whether in terms of the Œdipus situation or of the oral and autonomic reflexes. Healing of the breach on one side of the mind-body complex reduces the dichotomy of the other.

The basic dichotomy once having been established, the pattern is reproduced at every succeeding level of organization. The idealized and all-perfect good mother acts as the focal point onto which are grafted all later experiences which are emotionally of the same pattern—of nurse, sisters, girl-friends, ultimately wife; but only in so far as their experiences conform to type. Each in turn is idealized, and is viewed only as a replica of the original perfect mother, only the good in each is properly apprehended, the bad is rejected or extruded as an indigestible residue.

Memories of the bad mother are repressed, and her image reappears as the frustrating or castrating father, thereafter in all frustrators or castrators, all who stand in the position of authority and deprive or thwart. As with the series of good objects, so here also the blinkers are in position and only the bad is apprehended, the good rejected. By this process of grafting or crystallization of like upon like is built up a "sheep or goats" attitude to life; the whole world of the outer environment is viewed with the mentality of either-or, friend or foe, good or bad, and no object or person in life is seen as a real whole embracing both good and bad.

The resonance or sympathy between internal and external situations can account for the success achieved in therapy whether by retrograde or anterograde analysis. The retrograde is from the outer world. It analyses the emotions at their peripheral end, starting with the likes and dislikes of the present-day world and the persons onto whom they have become attached—wife, children, friends and foes of everyday life, each attracting its quota of mother-love or father-hate but only rarely both love and hate together. These emotions are freed from their repressions, and thus intensified are gathered or transferred onto the analyst, who must during this stage of the treatment remain outside the patient's real life. He lives only in the zona incerta of the analytical situation, as a phantasy that has materialized in flesh and blood yet who declines to crystallize into reality. In the unity of his person, however, the conflicting emotions of the patient are brought into an apposition from which there can be no evasion. They are traced backwards from the phantasy of the real analyst into the

phantasies of the past and to their origin in the real mother and father of childhood. Toward the end of a successful analysis the process goes into reverse, and the emotional attitudes of childhood, now rectified, pass back onto the analyst as a real person, apprehended in his own right and no longer viewed through the mists of phantasy, thence to the real events of the patient's outer world.

The anterograde approach dispenses with the transference-situation. It offers a series of deep interpretations, in terms of the oral reflexes and the real mother of infancy, of the emotions that have been displaced to the pelvic apertures, and transferred through the ages of childhood and maturity onto the personal contacts of real life. From whichever side the approach is made, there is a resonance or sympathy between the inner and outer sides because the unity which is the patient is an indisseverable whole.

The cardinal principle at every step is the replacement of dichotomy by integration. The polar concepts of love and hate, of good mother and bad mother, must be brought into an apposition from which the patient cannot escape, due regard being paid to his limits of tolerance. Thus brought together in the memories of the real mother, or in the person of the real analyst, they are unified into a harmonious opposition, a balanced antagonism of plus and minus which is the keynote of physiological tranquillity.

A second principle, no less important than the first, is that contact between the outer and inner worlds is achieved mainly through the oral reflexes. An infant suckling first makes contact with the breasts of its mother, and apprehends her imperfectly as all-good, or all-bad, through the sensory feeling-tones of the lips. It is primarily an oral dichotomy, therefore, that is healed in part or in whole at the formative crisis of five months. Unless the rift in the unbalanced polarity of hate and love is traced to its origin in the oral zone, it will not be healed. Analysis that penetrates only to the Œdipus situation and castration-fears at the genital zone, or to the ambivalence of anal and urethral hate and love, cannot succeed in a full rectification of the patient's emotional difficulties. It is moreover only through the oral zone, as pacemaker to the feeding-cycle and the alimentary and autonomic reflexes in general, that contact can be made between emotional and visceral levels. The establishment of this contact is the aim of psychosomatic medicine, in which functional diseases of the body are explained in relation to functional disharmony of the mind.

Successful passing through the formative crisis of infancy means not only that the troubles of weaning and teething have been surmounted, but also that the infant has accepted such of reality as comes within its experience, accepted it as a whole, its good and its bad, its nice and its not-nice, accepted it simultaneously rather than in succession. The harmony of oral-sucking and oral-biting underlies the harmony of love with hate rather than their discord; there is then no partition of mother-love from mother-hate, no shedding of the load of hate from mother to father which is the nucleus of the Œdipus position. Whether this has ever been achieved by a human infant, whether any child has passed into schooldays without its Œdipus complex, it is not possible to say. Nevertheless, and on physiological principles alone, it must be held as an ideal toward which the upbringing of future generations of children should be directed.

Nature has provided a sequence of opportunities to rectify the failures at this early level of five months. These opportunities are based upon the resonance of internal and external situations. If a real harmony subsists in the home between mother and father, there is an opportunity for love and hate to be reconciled in the outer world, leading to a reconciliation of hate and love in the inner world. If mother is not wholly idealized, but is apprehended as a real person who has her failings, then the good-mother and the bad-mother of inner phantasy, in diluted editions as the mother who is sometimes nice and the mother who is sometimes cross, are reconciled by the obvious fact of their being one and the same person in the outer world. Father also may serve as a focal point for the reconciliation of hate and love; as a real father who is loved, and yet as a just source of authority who is respected, that is feared, his polarity as part of the outer world is taken in by the

child and serves to unify the plus and minus of the inner world.

A happy home, then provides the most stabilizing solution of a partial failure at the formative crisis of infancy. The parents as a domestic unity of mother-plus-father, and each as an individual who reconciles love-plus-hate in their own persons, offers to the child an external solution to its inner difficulties which in the majority of cases is accepted.

Summary

The images of the good and bad mothers are built up on the oral reflexes and visceral sensations of the feeding-cycle and the reaction of frustration. Oral-sucking lust is projected as mother-love; oral-biting rage as mother-hate. For the first five months these are two separate images, dominating the mind in succession, never simultaneously.

At five months the visual memory centres start to function. The infant can retain the images of both good and bad mothers simultaneously. This is the "formative crisis". The physiologically healthy solution is to allow lust (parasympathetic) and rage (orthosympathetic) to work in balanced antagonism as a polar couple ensuring tranquillity (homoeostasis). Love and hate should be directed toward the same person, the mother, who is then apprehended as a real person, both good and bad (nice and not-nice).

This is the adult solution and is rarely achieved. To avoid conflict within, love and hate are directed towards separate objects without: love is retained by the mother who is idealized, hate is transferred to the father. This is the Œdipodal partition of love from hate. It involves an imbalance between parasympathetic and orthosympathetic, resulting in many of the visceral diseases studied by psychosomatic medicine.

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BRIEF CHLORPROMAZINE TREATMENT OF DISTURBED PATIENTS IN A PSYCHIATRIC RECEPTION HOSPITAL[1,2]

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Therapeutic measures have long been sought for acutely disturbed psychiatric patients in order to prevent lengthy hospitalization. This investigation was undertaken to evaluate chlorpromazine as a brief treatment measure in the Psychiatric Division of Kings County Hospital which functions as a reception and short term treatment center.

SUBJECTS AND PROCEDURES

Extremely agitated patients on the disturbed wards who were refractory to usual forms of sedation were selected for this study. Any severe organic pathology disqualified a patient. Twenty-three males ranging in age from 17 to 54 years, mean age 34, and 27 females ranging in age from 17 to 74 years, mean age 36, comprised the group of 50 patients. Sixty-eight per cent of the patients were 40 years of age or younger. Forty of the 50 patients presented schizophrenic reactions of various types. Two patients were diagnosed manic depressive psychoses; two were diagnosed involutional psychotic reactions; one, a psychotic depressive reaction; three, chronic brain syndromes; one, a schizoid personality; and one, delirium tremens. According to the available records, 27 of the patients included in this study had not previously been admitted to the Psychiatric Division of the Kings County Hospital nor to a state mental hospital. Five of the group had histories of previous admission to the Kings County Hospital Psychiatric Division but not to state mental institutions. Eleven of them had been in state mental institutions once, and 7 others 2 to 5 times.

In view of reports of hepatic dysfunction and blood dyscrasia in chlorpromazine therapy, liver function tests, a non-protein nitrogen test, and a complete blood count were performed three times a week in almost all instances. The liver function tests were the brom-sulfalein retention, total and indirect serum bilirubin, cephalin flocculation, and urine studies for bile and urobilinogen. Cholesterol and esters, total protein, and albumin-globulin ratio were examined periodically. These data are reported in detail in another paper (6).

Dosage levels of chlorpromazine were sought at which the patients would be quiet, cooperative and somewhat drowsy (14). This approach necessitated giving as much as 800 mg. per day in several cases. Most of the patients were maintained on levels of 200 to 400 mg. per day. It was necessary in 42 of the 50 cases to initiate treatment via the intramuscular route since the majority of these disturbed patients were uncooperative. The injectable form of the drug was given via stomach tube to a small group of patients who were being tube fed. It was necessary to use these methods for only a few days in about half these cases since some patients became cooperative within this time. However, some patients were electively continued via the intramuscular route.

Some patients were visited weekly by a psychiatric resident or members of the attending staff for evaluation; others were seen one to five times a week during their hospital stay. Furthermore, patients on chlorpromazine were attended every three hours by the nursing staff and three times a week by physicians in connection with hepatic studies. There was more contact with hospital staff members than can be given to most patients. After seven to fourteen days, many of the patients were transferred to quiet wards where they were able to participate in occupational and recreational therapies.

[1] This research was aided by a grant from Smith, Kline & French Laboratories, Philadelphia, Pennsylvania, who also supplied the chlorpromazine which is prepared under the name of "Thorazine".

[2] From the Department of Psychiatry, State University of New York College of Medicine at New York City, and the Psychiatric Division of Kings County Hospital, Brooklyn, New York, Service of Dr. Howard W. Potter.

Treatment was initially planned to span a period of approximately two to four weeks. Three patients were arbitrarily taken off the drug after five days, and several patients late in the study were continued beyond four weeks. Chlorpromazine was discontinued whenever there was evidence of persistent liver or hematological dysfunction or other intercurrent severe organic illness. When there was little or no psychiatric improvement in two to four weeks, the patients were ordinarily certified to state hospitals. When it was felt that adequate improvement had ensued, medication was discontinued, patients were observed for a week or longer, and, if the improvement was maintained, they were discharged to their homes. Discontinuation of the drug was abrupt rather than gradual, and no maintenance doses of chlorpromazine were prescribed.

After treatment was terminated, the patients' clinical records were evaluated. Pre- and post-treatment comparisons were made with respect to quality of affect, disturbances in thinking, tendencies toward autistic withdrawal, and such manifestations as hallucinations and delusions. In addition, changes in agitation, insight, judgment, and general intellectual functioning were clinically appraised.

Results

Forty-four of the 50 patients were extremely agitated prior to chlorpromazine therapy. Thirty-nine of these 44, or 89 per cent, quieted dramatically during treatment; the remaining 11 per cent showed no change. The majority of the patients were admitted for observation because of schizophrenic reactions of various types, and changes in such symptoms as constriction of affect, disturbances in thinking, and autism were noted. Fifty-six to 70 per cent of the patients showed improvement in various of these manifestations. Fifty-eight per cent of the patients presenting hallucinations and delusions showed amelioration. Approximately one-half of the patients showed some improvement in insight, judgment, and intellectual functioning (see table 1). As has been emphasized by many other investigators (2, 5, 10, 15, 20), the most outstanding and consistent improvement in this group was in the calming of agitated states.

TABLE 1.—Number of Patients out of Group of Fifty Showing Changes in Psychiatric Disturbances

Disturbance	Number Presenting Specific Disturbance	Number Showing Exacerbation during Treatment	Number Showing no Change	Number Showing Improvement	Proportion Showing Improvement
Agitation	44	0	5	39	.89
Disturbance of affect	50	0	15	35	.70
Disturbance in thinking	50	0	22	28	.56
Autistic withdrawal	47	1	17	29	.62
Hallucinations	26	0	11	15	.58
Delusions	36	0	15	21	.58
Insight impairment	50	0	27	23	.46
Judgment impairment	50	0	24	26	.52
General intellectual impairment	50	0	23	27	.54

Twenty-four of the 50 patients improved sufficiently to be discharged to their homes. Twenty-six did not show adequate improvement and were sent to mental hospitals. Thus, 48 per cent of the total group of patients were discharged to their homes after brief chlorpromazine therapy. This experience is similar to that described by Lehmann (14).

As mentioned above, 40 of the 50 patients presented various types of schizophrenic reactions. When the dispositions of these patients were reviewed in relation to diagnoses, it was noted that two groups of patients fared differently from the remainder. Eight of 11 with a diagnosis of schizophrenic reaction, acute undifferentiated type, and 5 of 7 with a diagnosis of schizophrenic reaction, schizo-affective type, were discharged to their homes. Of the other schizophrenic types, the chronic undifferentiated, the paranoid, and the catatonic reactions, only 4 out of 22 patients were discharged to their homes. The 10 remaining patients fell into 8 additional diverse diagnostic categories, constituting too few cases to permit evaluation of the effect of the drug in any specific category.

Various factors were investigated in terms of their relationship to the ultimate disposition of the patients. The entire patient group was divided into upper and lower subgroups, usually on the basis of the median, for each particular variable, and then chi-square tests were made of the statistical significance of the

division of the subjects in relation to their being discharged to their homes or being sent to mental hospitals. Since this study was conducted in a reception hospital with patients experiencing acute psychotic episodes, certain items of personal history and past mental illness were considered in relation to disposition. The age and sex of a patient, a history of previous state mental hospitalization, and the duration of symptoms before the current admission were not statistically significant items at the .05 level in relation to disposition.

The 50 patients were ranked according to the number of days they were maintained on chlorpromazine and were divided on the basis of the median time into two groups, 26 who received the drug 5 to 21 days and 24 who received it 22 to 51 days. Nine, or 35 per cent, of those who received the drug for shorter periods were discharged to their homes. Fifteen, or 63 per cent, of the group maintained on the drug for longer periods were discharged to their homes. This difference is significant at the .05 level. While it is generally felt, as is indicated by this finding, that prolonging treatment is important, Winkelman (20) and Ayd (2) have reported that continuing the drug without indications of improvement beyond three weeks' time is usually useless.

The possibility was investigated that favorable disposition, return home, was a function simply of the number of days in the hospital rather than of the number of days on chlorpromazine. The patients were divided into two groups. One group comprised those 24 patients hospitalized a total of 17 to 35 days, of whom 9 went home; and the other comprised those 26 patients hospitalized 37 to 72 days, of whom 15 went home. The chi-square test does not give evidence of a significant relationship between total length of hospital stay and the disposition of these patients.

Patients were next ranked according to their average daily dosage of chlorpromazine. The half of the group of 50 patients who received lower average daily dosages, namely 124 to 307 mg., was compared with the half of the group who received higher average daily dosages, namely 308 to 647 mg. Twelve patients on higher average daily dosages went home, and 13 were sent to mental institutions. Of those patients on lower average dosages, identically, 12 went home and 13 were sent to state hospitals. As long as the dosage of chlorpromazine is sufficient to quiet the patient, the dosage level does not appear to be a crucial factor. This finding parallels the reports by Ayd on hospitalized patients (3) and ambulatory patients (2) that large dosages were no more effective than 200 to 300 mg. per day. Lomas (17) and Pollack (19) have reached a similar conclusion.

In order to further explore the effect of dosage, by giving greater importance to extreme dosages, the 10 patients who received the lowest average daily dosages, 124–212 mg., were compared with the 10 patients who received the very highest average daily dosages, 456–647 mg. Four of the low dose group and 5 of the high dose group were discharged to their homes, giving a difference which is not statistically significant.

A statistical comparison was undertaken of the differences in patient disposition in relation to the number of patient visits by various members of the psychiatric staff. They were ranked according to the total number of times they were seen. Those patients, 24 in number, who were seen for individual interviews 6 or fewer times were compared with a group of 26 patients who were seen between 8 and 30 times. Ten, or 42 per cent, of the group of 24 patients who were seen less often went home; whereas 14, or 54 per cent, of the group of 26 who were seen more often went home. A chi-square test of these data does not give evidence of a significant relationship between the amount of general psychiatric attention received during such brief hospitalization and disposition in these 50 cases. An evaluation of this statistical result requires that account be taken of the very limited amount of psychotherapy available to these patients during their stays in the reception hospital and of the fact that the psychotherapy was done by a number of psychiatrists with differing backgrounds and training.

Significant liver dysfunction was present in approximately one-third of the patients. Only one patient developed jaundice. The bromsulfalein retention and the alkaline phosphatase tests were found to be the earliest and most sensitive indicators of hepatic dysfunction. It would appear advisable to use these more sensitive tests as cautionary indicators during chlorpromazine treatment rather

than the icteric index or serum bilirubin tests. Changes in certain hematological constituents were noted in about one-third of the patients. Eleven showed 7 to 21 per cent eosinophilia. Immature white blood cells such as myelocytes, promyelocytes and metamyelocytes were seen in the blood samples of 7 other patients. A leukopenia developed in 3 of the latter 7 cases. Thirteen of the 18 cases with hematologic abnormality were among the 17 who showed evidence of hepatic dysfunction. The liver and blood data are presented in greater detail in another paper (6).

The possibility of a relationship existing between the remission of psychotic symptoms and the development of liver dysfunction during chlorpromazine treatment was investigated. A comparison by means of chi-square between the disposition of the 17 patients who showed signs of liver dysfunction and of the other 33 patients revealed no significant difference. Only one patient in the study developed symptoms of Parkinson's disease, and his psychiatric condition necessitated his being sent to a state hospital, although there have been suggestions of a positive relationship between the development of Parkinsonian symptoms during chlorpromazine therapy and a favorable psychiatric outcome (1, 4, 8, 11).

Other side effects and complications were noted. Although lactation in female patients has been found to be quite common (13), and even incidence as high as 80 per cent has been reported among chlorpromazine treated patients (1, 18), only one patient in this series, aged 19, never pregnant, developed a breast discharge resembling milk after receiving chlorpromazine for 3 weeks. The discharge ceased after the medication was discontinued. Practically all patients developed voracious appetites, and weight gains of 10 to 15 pounds in 3 or 4 weeks were common. Hypotension, with systolic blood pressures below 90 mm. of mercury, occurred quite frequently in patients at bed rest as well as in those who were ambulatory. Doses were withheld when hypotension appeared, but invariably patients could be continued on chlorpromazine within a few hours. Twenty-two patients received chlorpromazine intramuscularly for a week or longer. Of this group, about one-third developed abscesses in their glutei or deltoids. Two required surgical intervention. Several female patients who were kept at bed rest longer than seven days developed urinary tract infections with typical symptoms of cystitis. It was felt that this complication was related to incontinence of feces in these patients. The usual infectious agent was Escherichia coli. A large number of patients complained of blurring of vision and drowsiness, especially during the first two weeks of therapy. An almost universal complaint was of dryness of the mouth and of thirst, and it was common for patients to drink from 3,000 to 5,000 cc. of fluids daily. A staff nurse who had handled the parenteral form of chlorpromazine for over a year developed a contact dermatitis which was so severe that she was unable to work for several months. This case very closely parallels the two cases reported by Lewis and Sawicky (16) involving contact dermatitis in two visiting nurses.

Discussion

Within a period of 16 months after the first patient was discharged and 2 months after the last one was discharged to his home, 7 of the 24 patients originally sent home were returned to the hospital, 3 within a week of discharge and the other 4 within a period of 1 to 5 months. At the time this study was carried out it was not feasible to provide psychiatric out-patient care or maintenance chlorpromazine therapy for discharged patients through routine hospital channels. None of the 7 discharged patients who were subsequently readmitted had effected arrangements for further treatment of any sort. Five of the other 17 patients discharged, on the other hand, had made arrangements with various psychiatrists for private treatment. Although these observations involved experience with a limited number of patients, it is our impression that greater protection against recurrences of episodes of acute mental illness would be achieved if definite arrangements could be made for psychotherapy upon discharge from the reception center.

Four patients with depression as the chief presenting symptom seemed to be more amenable to therapeutic approaches when treated with chlorpromazine. Despite reports that depressed patients do not tend to do well on chlorpromazine (9, 12), all four of these patients were discharged to their homes after

showing adequate amelioration of symptoms. None of them made arrangements for further treatment, and two of them were subsequently returned to the hospital.

Chlorpromazine was found to be very useful as an aid in bringing patients out of their acute psychotic episodes. It must be remembered that during this study the drug was ordinarily discontinued at approximately this juncture. In this respect it did not differ in use and goal from certain older therapies, such as electric shock and barbiturates, utilized in reception hospitals. However, chlorpromazine has certain distinct advantages over these other therapies, particularly in that memory is left intact and useful verbalization is frequently facilitated, in contrast to the memory impairment following the shock therapies. These advantages highlight the great value chlorpromazine therapy might have for such severely disturbed patients as were treated in this study as a preparatory step in a program of long-term out-patient care. Despite these beneficial effects of chlorpromazine therapy, no changes in basic character structure were noted. Brief chlorpromazine therapy in the reception hospital was considered to be an effective method of reducing the number of patients requiring further hospital care. Patients under the drug frequently solicit further psychiatric help. Chlorpromazine thus is very helpful during acute episodes in calming patients and in promoting accessibility. It is this greater accessibility which would appear to make possible earlier treatment of fundamental and precipitating conflicts.

The calming or quieting effect of chlorpromazine may be viewed, perhaps, as a decrease of anxiety concomitant with a decrease in mobility. Many of the patients were brought to the hospital as a result of aggressive outbursts or fear of such aggression. Possibly the ego reorganization and decrease in anxiety noted in some of the patients may be related to the enforced decrease in mobility brought about by chlorpromazine. A parallel can be drawn between this formulation and Freud's concept of the dreamer being able to dream with relatively little anxiety because of the inhibition of motor activity during sleep (7). The dream and the hallucinatory process are closely related. During sleep and when on chlorpromazine therapy, motor activity is decreased. This interference with motor activity gives the ego a respite and allows a decrease in anxiety. These factors would appear to merit further investigation.

Summary

Fifty disturbed patients were given chlorpromazine while on psychiatric reception wards. Liver and blood studies were run concurrently. Evidence of liver dysfunction and/or some hematological abnormality was noted in more than one-third of the patients. Jaundice and Parkinsonism were rarely found; specifically, one instance of each among the 50 patients.

Thirty-nine, or 89 per cent, of the 44 agitated patients were definitely calmed during chlorpromazine therapy. Smaller proportions, 46 to 70 per cent, of the total group of 50 showed amelioration of other psychotic symptoms and impairments. Patients with diagnoses of acute undifferentiated and schizo-affective schizophrenic reactions were found to be most likely to remit while under the chlorpromazine regimen.

Twenty-four of the 50 patients were subsequently discharged to their homes, and the remaining 26 required further psychiatric hospital care elsewhere. Significantly more of the patients treated for an extended period (22–51 days) were returned to their homes than of those who were treated for briefer periods (5–21 days). Significant differences in disposition rates were not found in relation to any of the following variables: total number of days in the reception center (17–35 versus 37–72 days), average daily dosage of chlorpromazine (124–307 versus 308–647 mg.), route of administration (intramuscular versus oral), age or sex, history of previous admission to a state mental hospital, duration of symptoms before current admission, or number of days on the wards before chlorpromazine therapy was instituted.

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BIBLIOGRAPHY

1. Ayd, F. J., Jr.: In Symposium: *Chlorpromazine and Mental Health.* Philadelphia: Lea & Febiger, 1955, pp. 56–57.
2. Ayd, F. J., Jr.: Treatment of psychiatric patients with Thorazine. *South. M. J., 48:* 177–186, 1955.
3. Ayd, F. J., Jr.: Large doses of chlorpromazine in the treatment of psychiatric patients. *Dis. Nerv. System, 16:* 146, 1955.
4. Brooks, G. W.: In Symposium: *Chlorpromazine and Mental Health.* Philadelphia: Lea & Febiger, 1955, p. 51.
5. Delay, J., Deniker, P., and Harl, J. M.: Treatment of excitation and agitation states by a method of medication derived from hibernotherapy. *Ann. Med.-psychol., 110:* 267, 1952.
6. Dickes, R., Schenker, V., and Deutsch, L.: Serial liver-function and blood studies in patients receiving chlorpromazine. *New England J. Med., 256:* 1–7, 1957.
7. Freud, S.: *New Introductory Lectures on Psychoanalysis.* New York: Norton, 1933.
8. Freyhan, F. A.: In Symposium: *Chlorpromazine and Mental Health.* Philadelphia: Lea & Febiger, 1955, p. 73.
9. Garmany, G., May, A. R., and Folkson, A.: The use and action of chlorpromazine in psychoneuroses. *Brit. M. J., 2:* 439, 1954.
10. Goldman, D.: Treatment of psychotic states with chlorpromazine. *J. A. M. A., 157:* 1274–1278 1955.
11. Goldman, D.: In Symposium: *Chlorpromazine and Mental Health,* Philadelphia: Lea & Febiger, 1955, pp. 93–94.
12. Hoch, P.: In Symposium: *Chlorpromazine and Mental Health.* Philadelphia: Lea & Febiger, 1955, p. 107.
13. Kinross-Wright, V.: Complications of chlorpromazine treatment. *Dis. Nerv. System, 16:* 114–119, 1955.
14. Lehmann, H. E.: Therapeutic results with chlorpromazine in psychiatric conditions. *Canad. M. A. J., 72:* 91–99, 1955.
15. Lehmann, H. E., and Hanrahan, G. E.: Chlorpromazine, new inhibiting agent for psychomotor excitement and manic states. *Arch. Neurol. & Psychiat., 71:* 227–237, 1954.
16. Lewis, G. M., and Sawicky, H. H.: Contact dermatitis from chlorpromazine. *J. A. M. A., 157:* 909, 1955.
17. Lomas, J.: Use of chlorpromazine in mental hospital patients. *Brit. M. J., 1:* 879, 1955.
18. Pleasure, H.: In Symposium: *Chlorpromazine and Mental Health.* Philadelphia: Lea & Febiger, 1955, p. 55.
19. Pollack, B.: In Symposium: *Chlorpromazine and Mental Health.* Philadelphia: Lea & Febiger, 1955, p. 134.
20. Winkelman N. W., Jr.: Chlorpromazine in the treatment of neuropsychiatric disorders. *J. A. M. A. 155:* 18, 1954.

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A PSYCHIATRIST LOOKS AT EPILEPSY

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General convulsions have been found to be associated with so many pathological conditions that epilepsy is now regarded more in the light of a symptom than as a disease, despite the fact that very often no underlying abnormality can be detected. Thus, fits may result from toxins, circulatory disturbances, tumours, asphyxia and drugs. Moreover, convulsions can be evoked in physically healthy people by "stimulating" the brain with an electric current, and, more puzzling still, this procedure may benefit patients who are suffering from mental disorder. In view of these facts, particularly the last, one cannot help wondering whether the nervous discharge associated with a convulsion is so chaotic and meaningless as is usually assumed. May it not on the contrary be the expression in crude and exaggerated form of laws which regulate normal nervous functioning? The role of the nervous system is one of adaptation, and any of the noxious influences listed above must seriously impair its capacity in this direction. Are we to suppose that under such conditions of internal stress it completely renounces its function and behaves in an utterly lawless manner?

In the following pages it is proposed to examine a general convulsion from three clinical aspects which promise to throw some light upon the subject. It will be considered: first, from the standpoint of Hughlings Jackson's theory of nervous dissolution, or evolutionary reversal; secondly, from the standpoint of the repetitive character of the convulsive movements; and thirdly, partly following Hughlings Jackson, as representing a fusion of many and various coordinated movements into a mass spasmodic movement. An attempt will be made to draw a parallel between these neuromuscular happenings during a fit and certain psychological happenings in the post-convulsive confusional state.

I. Nervous Dissolution or Evolutionary Reversal

A. Neurological aspect

Hughlings Jackson (19) who was greatly influenced by the writings of Herbert Spencer maintained that many of the symptoms of nervous disease could be explained on the basis of the Doctrine of Dissolution. Nervous dissolution proceeded in the reverse order to that of evolution, and in the course of it there was a reduction from the least organized, most complex and most voluntary behaviour towards that which was most organized, most simple and most automatic. While Jackson made great use of this hypothesis to explain post-convulsive phenomena, he never seems to have applied it to the convulsion itself. To him a convulsion represented a sudden, excessive and rapid discharge of nerve cells which for one reason or another had become unstable. This excessive discharge left the implicated nerve cells in a state of exhaustion so that for a time after the fit they were unable to exercise their controlling influence over lower centres. Hence, following a fit, there was a reduction to a lower evolutionary level.

In Hughlings Jackson's time no research work had been done on the way in which movement is developed ontogenetically. Had it been otherwise this great clinical observer might well have seen in the convulsion itself a re-awakening of an earlier pattern of behaviour or, in other words, a manifestation of dissolution or evolutionary reversal. There are now two schools of thought regarding the way in which coordinated movement is developed. According to one, the Sherrington school, it is evolved by the integration of simple reflexes into complex formations. According to the second school, with which the name of the neurophysiologist Coghill is associated, behaviour is integrated as a whole from the beginning, and from this "total pattern" local reflexes become segregated out as development

proceeds. The work of Coghill and his followers appears to be so little known to neurologists and psychiatrists that before proceeding it will be as well to give some extracts from a previous paper which refer to the subject (25):

"Coghill showed (6) how in the embryo of the amphibian Amblystoma movements destined to become local first formed part of a generalized movement. For instance, movements of the fore-limbs, hind-limbs and gills could not at first occur independently of trunk movements. As development proceeded, however, the limbs and gills were enabled to act by themselves by the dropping out of the trunk component. Coghill did most of his work on Amblystoma, but he considered his findings applied equally well to the human foetus. He says (7): 'I am convinced by a study of all available records of movements in human foetuses of the first six months that behaviour develops in man as it does in Amblystoma, by the expansion of a total pattern which is integrated as a whole from the beginning and by individuation of partial patterns (reflexes) within the unitary whole.'

"Barcroft and Barron (2) studying the sheep foetus found a certain amount of evidence which supported Coghill's theory. Their investigations showed that at an early stage of development extensive bodily reactions were evoked by stimulating the foetal head, and that as time went on independent patterns of behaviour—for example, respiration—became segregated out from the initial total response. While admitting the validity of some of the arguments of the opposing school, they conclude that, 'so far, therefore, as local and mass responses are concerned in the sheep, local mechanisms do appear to become segregated out from the total response in the sense implied by G. Coghill in his account of the development of behaviour in Amblystoma.'

"Observations on the human foetus have necessarily been scanty. Minkowski, a prominent worker in this field, although he did not subscribe to Coghill's views, is reported by Irwin (15) as having found in human foetuses considerable irradiation of nervous impulse. There were no isolated reflexes which were localized in the segments stimulated (as one would expect to occur on the basis of Sherrington's theory. TDP.); on the contrary, reactions from local stimulation tended to irradiate over the whole body. This finding of Minkowski's would seem to imply mass activity."

It will be seen that Coghill's theory of the development of behaviour as outlined above is directly opposed to that of Sherrington. The former is analytic; the latter, synthetic. According to Coghill, an original mass response becomes fractionalized as development proceeds, while in Sherrington's view simple reflexes become progressively compounded and integrated into a unitary whole.

And now to return to the epileptic fit. Does it represent a reversion to the massive type of behaviour alleged by the Coghill school to characterize early foetal activity? Behaviour in a general convulsion can certainly be described as massive, for during a fit the greater part of the skeletal musculature is thrown into action simultaneously, resulting at first in a sustained posture so rigidly constituted that the body can be rolled about in one piece like a corpse in rigor mortis. At the same time the limbs cease to be hinged appendages and lose their independence of action. Soon, of course, this tonic spasm gives place to intermittent clonic contractions, and as these progress, the "hinges" at the hips, shoulders, knees and elbows gradully become reestablished. It would be possible to see in all this a return to the type of behaviour said to be exhibited by the young foetus in response to stimulation. But is the massive response of the embryo convulsive in type? Coghill makes no reference to this, and perhaps in dealing with so small an animal as Amblystoma it might be a difficult point to determine. Barcroft (1), however, has more to say about the matter. He describes how the earliest movements of the sheep foetus are "jerky" in type, and how, as development proceeds, the movements become more "sustained". Later still, there is a suppression of all activity due to the intervention of inhibition. If, however, at this stage of inhibition asphyxia of the foetus be deliberately produced by pressure on the umbilical cord, intense activity again becomes apparent, and there is a reappearance of the "sustained" and "jerky" movements in the reverse order to that in which they were originally developed. To quote Barcroft's words: "The general picture presented by the central nervous system is that of a mechanism

which develops the power of jerky movement early. Later, these jerky movements become much more drawn out and irradiation more limited, and later still inhibition becomes developed and obscures movement. In the reverse order, as these traits are removed by interference with the normal environment (by asphyxia produced by pressure on the cord TDP.) the foetus simulates in turn ones in which the brain has been severed at progressively descending levels. Starting with a condition of quiescence, it passes through a stage of sustained extension to one of jerky movement, and finally it becomes immobile and dies. So also as the foetus deteriorates, it progressively reverts to the properties of earlier days."

Barcroft then goes on to say: "I may add that if instead of calling the movements typical of "release" in the foetus "jerky" I had called them "twitchings", or in more accentuated cases "convulsions", or even "marionette-like" movements they would not have been inaptly described." Although he does not specifically say so, Barcroft undoubtedly had in mind the neurological mechanism underlying convulsions in man, because the book in question deals prominently with the effect on the human brain of such conditions as oxygen excess and deficiency, carbon dioxide excess and deficiency, as well as hypo- and hyper-glycaemia, all of which may be associated with convulsive phenomena.

There are, therefore, some experimental grounds for regarding the earliest foetal movements as being both "massive" and "convulsive" in character, and we note in passing Barcroft's observation that in the sheep foetus ontogenetically earlier types of movement are re-awakened under the influence of asphyxia. In view of this it would appear at any rate a possibility that the human convulsion does not reflect as is generally assumed a meaningless, excessive discharge of unstable nerve cells, but arises from a sudden reversion of nervous activity to a prenatal pattern of functioning. But it would not fit the facts to call this a "release" from higher control of an earlier type of functioning because, as Hughlings Jackson maintained (18) we are in the case of a general convulsion dealing with a discharge of nerve cells beginning at the "highest level". The possibility of release from higher control could not, therefore, arise. There is, however, an alternative possibility, based on a principle which, although hitherto mainly of psychiatric interest, may well turn out to have general biological validity. It is that in response to adverse conditions in the environment the organism tends to "regress" to an earlier pattern of behaviour.[1] Applying this principle to the convulsion we could regard the implicated nerve cells as reverting to a primitive pattern of discharge in the face of difficulties of adjustment brought about by an unfavourable internal environment. In other words, a convulsion would represent a stress reaction. Admittedly, there is usually no *external* stress, but under conditions of impaired nervous functioning the pressure on adjustment exerted by a normal environment would have the same effect as if external stress existed. And even in the case of idiopathic epilepsy, where no pathological factor has been ascertained to date, there is presumably some morbid influence at work impairing nervous functioning.

B. Psychological aspect

The next question to consider is whether there is associated with this suggested neurological dissolution during a fit a parallel psychological regression. In a very wide psychiatric sense regression may be defined as the re-living by an individual of his past, or part of it, in the present. There are some grounds for believing that it is the psychological correlate of nervous dissolution (26), although regression appears to be an active process brought about by difficulties of adjustment, whereas nervous dissolution is usually regarded as passive (a "letting go") . If the two are indeed related, we should expect to find evidence of regression in the post-convulsive confusional state where nervous dissolution (or "release") is widely agreed to be present. Unfortunately, idiopathic epileptic fits do not occur to order, and when they do happen to be witnessed by the physician, the time and place are often inconvenient for the carrying out of psychological investigations. However, some twenty years ago there was put into the hands of psychiatrists a means of studying epilepsy which would have gladdened the heart of

[1] R. Brun, quoted by Dunbar (8), applies the concept of "regression" to the behaviour of the caterpillar and queen bee under conditions of deprivation.

Hughlings Jackson. I refer to the use of the convulsant cardiazol (known in the United States as metrazol) as a therapeutic agent. From then on we were able to induce fits in the human subject at will, and to observe their onset, development, and after effects under conditions comparable to those of a laboratory experiment. With the introduction of the electrical method these opportunities for research have somewhat diminished, for in the case of cardiazol the post-convulsive confusional state is more pronounced and more prolonged than after a fit induced by electricity. However, although many of the observations we are about to consider were made in the first instance on patients undergoing treatment by cardiazol, they are also applicable to the ECT fit and, attention having been called to them, should be readily susceptible to confirmation by anybody using the electrical method. Lest it be argued that the findings in cardiazol convulsions are inapplicable to pathological forms of epilepsy, the reader is reminded that the EEG in metrazol induced fits is said to be similar to that in grand mal (22).

As a rule five to ten minutes after a therapeutic fit any initial restlessness will have disappeared, and the patient will have sunk into a condition of confused quiescence which later merges into ordinary sleep. But during this period of quiescence partial rapport can be established with him by means of repeated questioning and stimulation, although he shows a distinct dislike to being roused, and much resistance has to be overcome before satisfactory contact is made. It should be mentioned that later on when he has fully recovered consciousness, the patient will remember little or nothing of anything he has said or done while in this post-convulsive state. The first thing we find when contact has been established is that the patient is suffering from a retrograde amnesia: for a quarter of an hour or more after his fit he has no recollection of having been given the treatment, or of any of the circumstances attending it. The retrograde amnesia may extend back for days, weeks or months, but the further back we trace it, the more patchy does it become. The events immediately preceding the convulsion are more or less uniformly obliterated, but of the more remote events some are remembered while others of the same chronological level are not. This retrograde amnesia itself suggests a slight reversal of individual evolution since recent experiences are affected most. It can usually be shown, however, that in addition to the retrograde amnesia (negative symptom) there is a re-awakening of past orientations, knowledge and attitudes of mind which have long lain dormant (positive symptom). In the post-convulsive confusional state the patient is in certain respects re-living former stages of his life, and in this sense there is regression. Here are a few illustrations taken from an earlier paper (24):

If patients are asked to write their names and addresses before their therapeutic fits, and again at the earliest possible moment afterwards, some 50 per cent will write an old address in the post-convulsive state, sometimes one at which they lived twenty years before. While it is easy to understand how the retrograde amnesia might obliterate the memory of their present address, this would not fully account for the belief that they are living at an old one, especially if, as is sometimes the case, they had lived at the old address for a shorter period than at the present one. Again, if the patient be asked after a fit to give the name of his employer, he may give the name of a former employer in preference to the present one. This again, seems to indicate a re-living of the past. The same thing can be brought out by questioning patients regarding the current price of goods, e.g., cigarettes, which have risen in price in recent years. In many instances in the post-convulsive state the old price is given in preference to the present one. Similarly, the name of a Prime Minister of bygone days may be substituted for that of the one now in office. In the case of elderly patients this re-living of the past may be demonstrated in another way. Some patients whose hair is grey or white may insist after a convulsion that it is brown or black, or whatever its original colour was. Others may argue that they still have their own teeth although they are in fact edentulous. Others, again, may deny that they need glasses for reading. Lastly, patients who are cricket or football enthusiasts, and who normally know the name of every player on their favourite team, may after a fit include in the team players of twenty years ago.

All this seems to suggest that after a convulsion there is a turning back of the pages of life's history. It cannot be too strongly empha-

sized, however, that the regression is not uniform. After a fit a patient may give the name of a Prime Minister who functioned forty years ago, and yet at the same time he may be perfectly aware that he has a wife and children which he acquired much later. Again, he may say that a letter requires a penny stamp which it once did, and yet be quite sure of the present price of a packet of cigarettes. As will be stressed in a subsequent section, after a convulsion there is a *telescoping* of experience with the accent on the distant past.

II. Repetition

Repetition of movement is an invariable accompaniment of a general convulsion. The rhythmic jerks known as clonic spasms show this characteristic in its simplest form, but the preceding tonic spasm can be interpreted in the light of a number of clonic spasms fused together. Hughlings Jackson was the first to suggest this relationship between tonic and clonic spasms. He says (16): "In tonic spasm the intervals are so short that the very 'idea' of succession is lost; the intervals are indeed bridged over, and there is, in a sense, no apparent movement—as the humming-top, when in excessively rapid rotation, seems still." Actually, in cardiazol induced fits the tonic phase is preceded by a few clonic jerks. Moreover, during the first few clonic spasms which follow the tonic phase, the posture adopted in the preceding tonic phase is momentarily reassumed. Both these facts support the view that tonic spasm consists of fused clonic spasms.

This repetition of movement during a convulsion is not without interest from the standpoint of evolutionary reversal discussed in the previous section. Barcroft tells us (3) that at a very early stage of development stimulation of the sheep foetus "causes not merely one spasm, but a series of perhaps twenty spasms, one after another, amounting to a rhythm." It would be possible, therefore, to regard the repetitive character of movement exhibited during a convulsion as a further indication of the reduction of behaviour to its earliest beginnings. However, what interests us more here is that the phenomenon of repetition evinced during a convulsion can still be demonstrated, although in more highly evolved form, during recovery from the fit.

Let us return to the therapeutic fit. When restlessness develops during recovery, a repetitive but coordinated movement may sometimes arise out of some vaguely purposeful action. Thus, a patient may repeat over and over again the movement of drawing the covering blanket up to his chin. Or another who has been stimulated by having his hair gently pulled may continue to execute defensive movements long after the hair-pulling has ceased. At this stage, also, fixed attitudes of the catatonic type may sometimes be observed, and, as already suggested, the difference between a fixed attitude and a repetitive movement in the same direction is only one of degree. Whether or not any form of mental functioning accompanies such post-convulsive movements and fixations is impossible to tell because at this stage of recovery verbal contact with the patient is out of the question.

Once rapport has been established, however, repetition in speech, reading and writing can usually be demonstrated. A man who has been roused from his post-convulsive sleep may answer the first question put to him quite sensibly, and then give the same answer to all subsequent questions. He shows no dissatisfaction with his "barrel-organism" as do some non-epileptic aphasics, and there seems to be no attempt to say anything different from the words uttered. Again, in writing an address, words, syllables and individual letters may be repeated over and over again. Indeed, when he has reached the foot of the sheet of paper, the patient may continue his repetitive writing on the bedclothes. It is the same with reading. If the patient be given a newspaper to read aloud he may keep on repeating a word or sentence, or, alternatively, he may read horizontally across the newspaper disregarding the vertical lines between the columns and, of course, completely ignoring the lack of sense in what he reads. Apparently, when the eyes are set on a horizontal course, there is difficulty in altering this adjustment. Here we have *persistence* rather than repetition of movement.

It might be argued that such repetition in speech, reading, and writing could be due purely to motor repetition, i.e., to mindless repetition of a piece of behaviour. There is certainly no definite evidence that it is the idea behind the movements that persists. Be that as it may, there is not a shadow of doubt that in the post-convulsive state ideas as well

as movements *do* persist. This can sometimes be shown by giving the patient some simple task to perform, e.g., threading a needle. After its successful performance, the urge to perform it may persist, and in his efforts in this direction the patient may employ movements different from those he used in the first instance. Under such circumstances it is clearly the idea and not the movements that persists. Nevertheless, any form of repetitive behaviour set in motion after a therapeutic fit may start off clearly harnessed to an idea and then degenerate into mindless repetition of a movement. This is probably due to fatigue giving rise to a further difficulty of adjustment, the result being that the character of the behaviour sinks to a still lower level. As already stated, repeated questioning and stimulation are necessary to maintain rapport with a patient in the post-convulsive state, and there is an ever present tendency for him to sink back into unconsciousness. A task begun well, therefore, may degenerate in quality as time goes on.

The following is a good example of the blind persistence of an idea (that of writing) after a therapeutic fit:

Case 1: About twenty minutes after a therapeutic fit a patient was asked to write his name and address on a piece of paper. He at once scribbled some nonsense on the upper part of the sheet. The position of the sheet was then altered so that the scribbling was at the bottom of the page, and the patient was invited to write his name on the unspoiled top half. However, his attention could not be diverted from the lower half of the sheet on which he had already scribbled, and he superimposed more scribbling on the nonsense he had already written there. It was as though his attention was anchored to that part of the sheet of paper. The doctor then covered the scribbling with his (the doctor's) hand, so as to force the patient to write on the clean part of the sheet. However, he continued to scribble on the doctor's fingers, that is to say, in the same locality as he had scribbled before. The paper was then removed altogether, but the patient continued to scribble on the bedclothes. Next, the pencil was removed from the patient's hand, whereupon he went through the movements of writing with his right index finger, using it as if it were a pencil. When the doctor held this finger, the patient switched to the left index finger and made the movements of writing with it. Finally, the doctor held both index fingers, but, not to be defeated, the patient tried to write with his right thumb. Thus, the idea of writing persisted in spite of every obstacle, and there was an additional tendency to keep the writing in one place.

Another interesting example of ideational perseveration after a convulsion is furnished by the following case:

Case 2: A man after a therapeutic fit was asked to copy some printed matter into a notebook. He did so, but with much repetition. The notebook was then taken away from him and placed on a table by his bed. The patient was now given a sheet of paper and asked to write on it his name and address. However, every time he started to do this his eyes were drawn, as if by a magnet, towards the table on which the previously handled notebook was lying; indeed, he made several attempts to get hold of the notebook, but was prevented from doing so. He was next asked to give his name verbally, which he did correctly. Now, he was again asked to write down his name and address on the paper, but his eyes went back to the notebook on the table, and once more he tried to get hold of it. Although he was able to give his name verbally, whenever he was invited to write it on the piece of paper his mind was drawn to the notebook in which he had written in the first instance. It will be noted that he had never written his name in the notebook; he had merely done some copying in it. It was apparently the idea of "writing in the notebook" that persisted.

Finally, the patient was shown a clock and asked to tell the time, which he did correctly. After this he was again asked to write his name on the sheet of paper, but instead of doing so he drew a clock-face. He now could not get rid of the idea of the clock.

The tendency of ideas to persist or recur after a therapeutic fit sometimes leads to the superimposition of an idea upon its successor. This will be referred to again when we come to the topic of fusion, but two illustrations may be given here:

Case 3: A patient in the post-convulsive state who had read the time on a watch correctly was next shown a coin (a halfcrown) bearing the date 1920 and asked what it was. He said it was "twenty past". The idea of the watch persisted and was transferred to the coin, the the circular shape of the latter no doubt contributing towards this. The position of the figure 20 in the lower right quadrant of the coin provided the further stimulus for the answer "twenty past".

Case 4: Another patient after a convulsion was asked to do a sum in simple addition submitted to him on paper. He did the sum correctly. He was then asked to write down his name, whereupon he wrote the letters of his name one under another in the style of a sum in addition, drew a line underneath, and put down the answer to the original sum. The idea of the sum persisted and intruded upon the idea of writing his name.

Further examples of perseveration after therapeutic convulsions will be found elsewhere

(23, 24). Those mentioned here will suffice to show that the repetition of movement, which is so conspicuous during the clonic spasms of a convulsion, continues to manifest itself in coordinated form after the termination of the fit, and that there is a parallel tendency towards repetition or persistence of ideas.

III. Fusion

Hughlings Jackson (17) held that an epileptic fit was nothing else than a sudden, excessive and rapid development of the patient's normal movements, which by operating contemporaneously lost their individuality. He pointed out that the fit may involve in this way any of the patient's commonplace daily movements, e.g., movements of the eyes in looking; of the face in its various expressions; articulatory movements. He goes on to say: "But from such developments (in the fit) there is no looking, smiling, talking, etc., because all the movements which are developed, being nearly contemporaneously developed, are 'run up' into a muscular fight." Put briefly, Jackson regarded an epileptic fit as a "clotted mass of movement". Viewed from the standpoint of Coghill's theory of development this fusion of movement during a fit would correspond to a de-differentiation of behaviour, or a return to the mass movement out of which localized movements have evolved. However, even those who cannot accept this idea of ontogenetic reversion during a fit will admit the fact of fusion of movement in Hughlings Jackson's sense. Now the interesting thing is that in the post-convulsive confusional state there is a parallel fusing of ideas as, indeed, the very word "confusion" implies. In this state the patient tends to fuse together orientations, identities and experiences with the greatest freedom. In an earlier section when discussing the partial regression which follows fits, it was stressed that, although the patient was in certain respects living in the past, he was also partially in touch with the present, and that there was in fact a *telescoping* of experience. There was, therefore, not only a recapitulation of the past, but also a fusing of events belonging to different chronological levels. Here are a few illustrations taken from the source already quoted (24):

Case 5: A patient after a therapeutic fit (given during the 1939–45 war) knew that Churchill was Prime Minister of England and Roosevelt President of the United States, but at the same time thought that General Pershing commanded the United States troops. He was in fact telescoping the events of the 1914–18 war into those of the Second World War.

Case 6: Another patient after a fit was quite clear about the belligerants in the Second World War, but thought that Admiral Beatty commanded the British fleet, which he did in the 1914–18 war.

Case 7: A third patient, also being treated during the 1939–45 war, after a fit knew all about the respective roles of Churchill, Roosevelt and Mussolini, but insisted that the Kaiser was still head of Germany, and that the Czar still ruled Russia.

Case 8: A patient who was a great football enthusiast was asked after a therapeutic fit to give the names of the players of a well-known team. He proceeded to do so, but included the names of some who had played for the team about fifteen years previously, i.e., he gave a team composed of past and present players.

These four patients were well aware of the true facts in their normal waking state, but in the confusion following a fit there was a merging of past and present experience.

Another aspect of this fusing of psychological material after a fit is afforded by a tendency on the part of the patient to identify the doctor with other people whom he has known in the past. A man who is recovering from a therapeutic fit may mistake the doctor for one of his parents, his old schoolmaster, a former medical attendant, a foreman, an officer or his employer; in fact, with anyone who has been in a position of authority over him. But although the doctor is called by the names of these people, he is also recognized as the person he really is, so that to the patient he represents two or more people fused into one.

So far we have dealt with the fusion of experiences widely separated in time. However, there is after a fit an additional tendency to fuse together recently activated psychological material. This may be shown in the writing of an address, where one word may be combined with another to form a composite word. For instance, an address such as "Marlborough Road, Romford" may be fused into "Marlford Road", the word "Marlford" con-

taining elements of both "Marlborough" and "Romford". Such manifestations of fusion are very common.

Again, in the post-convulsive confusional state two distinct trains of thought may be combined to produce the most grotesque results. Two illustrations have already been given in the section dealing with "Repetition". Here are two more:

Case 9: A man whom we shall call James Brown, when recovering from a fit, was asked to write his name and address. He interpreted the request literally and wrote the words "name and address". Pressed further, he wrote James Brown, and under it the figure "57", which was the correct number of his house in the road in which he lived. He, thus, started off to write his name and address correctly. At this stage, however, the figure "57" underneath his name evidently reminded him of a sum in multiplication, for he drew a line under the "57", so that what he had written now became

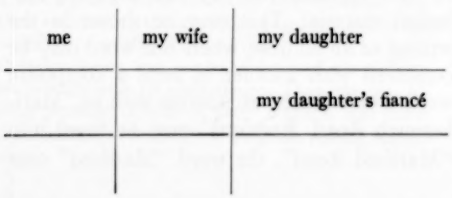
James Brown
57

and proceeded to try to multiply his name by 57. After repeating over and over again "seven times Brown", he finally said "I cant do it", and gave up the attempt.

Case 10: A man who was recovering from a therapeutic fit was asked to draw a man. He did so in crude fashion. He was then asked to write his name, but instead of doing so he drew another man, spelling out his name as he drew the figure. Here, as in the last case, two trains of thought were combined.

Reference has already been made to the fact that patients in a state of post-epileptic confusion sometimes identify the doctor with people whom they have known in the past. But the process goes further than this, for the identities of individuals simultaneously present, or even visualized, may be fused, as is shown in the following case: . . . .

Case 11: One of the few patients undergoing convulsion therapy to remember his experience on fully recovering consciousness said: "Your ideas get mixed. When I think of Mr A (a male nurse who assisted at the ECT) Mr B (another assistant) comes into my head, and when I think of Mr B you (the doctor) come into my head." He then made the following diagram to illustrate the effect of a convulsion on his mind:



Referring to this diagram, he said: "ordinarily these (himself, his wife, his daughter and his daughter's fiancé) are all separate in my mind, but after treatment they cease to be distinct and I cannot differentiate between them."

The reader is referred elsewhere (24) for further examples of psychological fusion following fits. Enough has been said to show that an epileptic fit, which Hughlings Jackson regarded as consisting of many normal movements fused together, is followed by a mental state in which there is a parallel fusing of ideas. After a fit ideas suffer the same fate that movements suffered during it: they lose their individuality by operating "contemporaneously". But the reader may be saying to himself, "All confusional states are characterized by the mixing up of ideas; the process is not specific for post-convulsive confusion." And so let us proceed to our discussion.

Discussion

In the foregoing pages we have considered a general convulsion from three aspects: dissolution or evolutionary reversal, repetition and fusion. It will be evident, however, that the distinction between them is somewhat artificial, since one may contribute towards another. For instance, a movement which is *repeated* sufficiently rapidly will lead to *fusion*, and an idea that *persists* may *fuse* with a succeeding idea. Again, *evolutionary reversal* in the Coghillian sense implies not only *repetition* of a former pattern of behaviour, but the *fusing* of many independent movements into a mass movement. If we try to consider one of these principles by itself, before long we are involved in another. It would appear that what we are really witnessing during a convulsion is an attempt on the part of the nervous system to achieve functional uniformity or increased homogeneity, and that the three principles in question represent different aspects of this process.

During a convulsion the greater part of the skeletal musculature is contracting simultaneously, and all in the same way, i.e., by spasm, and in a rhythmic or a sustained manner. It is suggested that this represents a dedifferentiation of movement in the reverse order to that of evolution, variety of movement giving place to stereotopy, and localized movements becoming merged into the mass

movement from which, according to the Coghill school, they were evolved. All this tends towards homogeneity.

Corresponding to these events in the sphere of movement during a fit, we assume a similar de-differentiation to be taking place in the sphere of nervous functioning. Thus, we can picture a widespread involvement of the brain in a foetal pattern of activity. More neural dispositions would be discharging in the same way at the same time than is normally the case. Here again, there would be greater homogeneity.

Turning to the post-convulsive state we continue to find this over-all trend towards homogeneity, which can be viewed from any of the three standpoints of evolutionary reversal, repetition or fusion. Repetition is manifested in both psychic and somatic spheres, while all three principles operate in the realm of thought. Of course, the movements which are repeated in the post-convulsive state are coordinated and, therefore, of a totally different character from the clonic spasms of the preceding convulsion. Nevertheless, they are subject to the same governing principle, viz., repetition, and in this respect they are comparable. It is also true that an event in the psychic sphere is something quite different from a physical event; ideas and movements are incomparable. Here again, however, it is the governing principles we are comparing, not the events themselves, and it is a matter of considerable interest that the same principles which regulate behaviour during a convulsion continue to regulate mental functioning in the post-convulsive state.

The next question that arises is: "Are these mechanisms peculiar to the convulsive process, or are they to be found in other nervous diseases, and, perhaps, in normal nervous and mental functioning? If, as has been suggested, a convulsion represents a neurological stress reaction, we should expect to find similar principles at work, albeit in more refined form, whenever adaptation becomes difficult from either internal or external causes. We have already seen that the three principles, as manifested in the post-convulsive state, are capable of operating in a more highly evolved form than that exhibited during a convulsion, and, furthermore, that they can influence mental as well as motor functioning. Bearing in mind, then, their capacity for expression at higher integrative levels, as well as the apparent parallelism between their psychic and somatic manifestations, let us refer to some other conditions in which one or other of these mechanisms plays a part. As already stated, the ultimate goal of the three mechanisms is apparently the achievement of homogeneity, but it is simpler to consider them apart from this. It will, of course, be appreciated that owing to limitation of space only the briefest reference can be made to these wider fields of operation. All that is intended is to draw the reader's attention to them.

Regression

Let us take evolutionary reversal or regression first. This takes place in all those nervous diseases to which Hughlings Jackson applied his theory of Dissolution. There is in these conditions a reactivation of the evolutionary past in the sense that there is a reduction from the voluntary to the automatic, from the complex to the simple, and from the least organized to the most organized. Freeman (9), however, goes further than this and interprets a number of clinical manifestations resulting from organic brain disease on the basis of ontogenetic reversion. Among these are: abnormal postural reactions, extensor plantar response, automatic associated movements, involuntary movements in a hemiplegic limb, reflex grasping and groping, and pathological laughing and crying. He regards these as exemplifying a return to forms of behaviour characteristic of the normal infant or young child. Freeman accepts Coghill's theory of development, and sums up with this statement: "The effect then of focal destruction of some part of the cerebral hemispheres is to cause a regression, a de-differentiation of function to a lower order, but a function for which a counterpart may be observed in the individual whose nervous system is as yet immaturely developed."

Head (14) observed a similar tendency to revert to childish modes of expression in cases of aphasia. But he issues the following warning, which is relevant to the view of regression adopted here. He says: "But the mechanism underlying symbolic formulation and expression is not a palimpsest from which, when the more recent writing is removed, an earlier

text is revealed in primitive form. The aphasic may return to the less exacting methods of solving a problem which resemble those adopted in childhood; but his mind differs fundamentally from that of a child." Thus, in aphasia, as in the post-convulsive state, there is a telescoping of childish and adult characteristics.

Again, regression may occur after a head injury. Russell (27) in a study of retrograde amnesia following head injuries mentions the fact that during the confusional state following such an injury the patient may give the date as several years previously, with a corresponding reduction in his age. Russell also states that for a limited time after the injury the patient may re-live his childhood.

Turning to the field of psychiatry, the phenomenon of regression is so widespread and well recognized that there is hardly need to mention it. It occurs not only in organic brain disease such as senile dementia, a condition in which the patient partially re-lives his past, but also in the psychoneuroses and psychoses. Freud invokes this principle freely in respect to the behaviour of the sexual instinct in the face of difficulties of adjustment. He maintains that in neurotic illness the libido retraces the pathway of its development and once again operates as in childhood. However, in Freud's view regression can occur apart from mental illness, for he demonstrated it to be an invariable accompaniment of dream formation (11).

It will be appropriate here to emphasize again that regression is hardly ever uniform or complete; there is usually a mixing of past and present or, put in another way, an intrusion of the past upon the present. This holds good for dreams, psychoneuroses, psychoses and organic brain disease. Incidentally, the fact that an individual may revert in some respects to childhood, while still retaining most of his adult characteristics, renders it very easy for the phenomenon of regression to be overlooked.

Before leaving the subject of regression, mention must be made of a closely allied, but not identical, feature of normal mental functioning: that of memory. When we recall the past, we do not re-live it, but the very fact of recall indicates a reference backwards. And who will deny the enormous part played by memory in the service of adaptation? In discussing the subject of "imagery" which plays an important role in "remembering" Bartlett (4) says: "By the aid of the image, and particularly of the visual image—for this, like the visual sense, is the best of all our distance receptors of its own type—a man can take out of its setting something that happened a year ago, re-instate it with much if not all of its individuality unimpaired, combine it with something that happened yesterday, and use them both to solve a problem with which he is confronted today." The reader will note that in this example given by Bartlett there is not only a revival of the past, but a combining (fusing) of past and present experience in an effort to achieve adjustment. The suggestion that memory and regression are related is not really so far-fetched as might at first appear, for when a patient has had a number of therapeutic convulsions, he will often spontaneously remark in the intervals between his fits, that events which he has not thought of for years keep coming back to his mind. He does not now re-live these events, as he tends to do in the post-convulsive state; they are merely involuntarily recalled as memories.

Repetition

And now we take the second principle operating during and after a convulsion: repetition. Whether this involves repetition of a movement, as in the clonic phase of the fit, or a sustained posture, as in the tonic phase, we must postulate the persistent passage of nervous impulses along a particular pathway. The difference between repeated and fixed behaviour of the same type is only one of degree. A similar imprisonment of nervous impulse may be presumed to parallel the persistent and recurring ideas observed in the post-convulsive state. Turning to the general field of neurology and psychiatry, we find a variety of physical and mental symptoms which present this fundamental characteristic of repetitiveness, e.g., perseveration, stereotypy, catatonia, verbigeration, recurrent utterances and obsessions. Brickner (5) and others, in a study of the neurophysiological events underlying obsessive and compulsive behaviour, have drawn attention to this diversity in the form of expression of repetitive neural action. Among

their case material they refer to patients suffering from oculogyric crises who experienced fixity of mental processes in association with ocular fixation. They conclude that "in studying the various and widespread reflections of repetitive neural action a natural order is found, starting with the simplest motor phenomena having no obvious connection with obsessive and compulsive states, but leading by evidently inseparable stages to manifestations which, by appearance, are indistinguishable from obsessive and compulsive acts." These authors also point to instances of repetition and fixation of movement in the normal behaviour of man and animals, e.g., states of maintained muscular tone, the tail-waving of resting fish, respiration, heart beat, laughing, sobbing and the orgasm.

Reference above to the simultaneous occurrence of fixation of thought and ocular fixation in cases of oculogyric crisis brings to the mind of the present writer two post-encephalitic patients who presented similar features:

Case 12: The patient, a post-encephalitic, during each oculogyric crisis hallucinated his dead father hanging from a rope. The father had actually committed suicide in this way, and the patient had been the first to find him. The hallucination persisted throughout each attack of ocular fixation.

Case 13: This patient, also a post-encephalitic, did not have oculogyric crises but, instead, bouts of immobility during which his mind became anchored to whatever thought or action had immediately preceded the attack. For instance, he would be found in a fixed attitude in the lavatory looking down into the lavatory pan, which he had just used. On being asked what he was doing, he would describe how he was trying in imagination to re-unite the torn pieces of toilet paper lying in the pan, i.e., to reconstruct (or repeat) an immediately preceding situation. The same patient after signing his name on a document would feel compelled to do it all over again and, before proceeding to do so, would insist on putting the paper and pencil in the *exact* positions they had occupied before.

Another writer, Levin (21), calls attention to this tendency of perseveration to manifest itself at different levels of functional complexity. He gives illustrations of its occurrence (a) in relation to the simple motor functions of grasp and posture, (b) in relation to the more complex functions of speech, and (c) in relation to the still more complex functions of mentation. Levin concludes that the appearance of perseveration at different functional levels is "in keeping with the principle that all levels of the nervous system, however they may differ in complexity, are fundamentally of the same constitution."

In the field of psychoanalysis we again find much emphasis laid on what is called the *compulsion* to repeat. Freud (10) refers to the tendency of children in their play to repeat even unpleasant experiences, and to their insistence on being told the same story over and over again. He further maintains that in the traumatic neuroses the patient's dream life continually takes him back to the situation of his disaster. Freud considers that the compulsion to repeat the past is a characteristic of primitive instinct, and reflects a tendency innate in living organic matter impelling it towards the re-establishment of an earlier condition, which it had to abandon under the influence of external disturbing forces. As illustrations he mentions the arduous journeys undertaken by certain fish at spawning time in order to deposit their sperm in waters believed to be the earlier homes of their kind, and to the migratory flights of birds of passage.

That the tendency towards repetition is, as alleged by Freud, deep-seated and primitive may have something to do with the undoubted success of rhythmic stimuli in inducing the hypnotic state or, to take a simpler example, in promoting sleep in a child. However, we have only to ponder on the part played by rhyme, rhythm and symmetry in the realm of art to realize the importance of repetition in normal mental life. Repetition is evident, not only in the crude dance rhythms and chantings of primitive peoples, but also in the recurrent motifs of the ballet and classical music, becoming ever more sophisticated with the advance of culture. The fact that participation in such activities gives pleasure, and affords relief from the stress of everyday life, would seem to suggest a function of adjustment.

Fusion

Finally, we come to the third process operating during a convulsion: fusion. We recall that Hughlings Jackson regarded a convulsion as a sudden, excessive and rapid development of the patient's normal movements, which by operating contemporaneously lost their individuality; in other words, a merging of many

movements into one. This corresponds to the merging of partial paterns of behaviour into a mass reaction, i.e., a reversal of Coghillian evolution. We also recall that this tendency towards fusion was evident in the psychic sphere in the post-convulsive state, ideas tending to persist and to intrude upon succeeding ideas, or events widely separated in time becoming telescoped together, or the identities of two or more people becoming merged into a composite figure.

It is in the psychic rather than in the somatic sphere that the principle of fusion is most clearly demonstrable in conditions apart from a convulsion. In the psychiatric field it manifests itself in crude and exaggerated form in all confusional states. This is shown in the following ways: 1) By doctors and nurses being addressed by names other than their own, while at the same time being accepted for what they really are. 2) By the mixing of orientations in time and in space. 3) By the frequent intrusion of one train of thought upon another, so that none is sustained for long. Of course, in these confusional states fusion fulfills no useful purpose, but nonetheless it can be interpreted as an exaggerated and futile attempt at adaptation.

Again, fusion can be observed in dream formation, where it is known as "condensation". According to Freud, the manifest content of a dream, that is, the dream as we remember it, arises from a compression of a multitude of references into a single presentation. This compression is achieved in several ways, but, interestingly enough, one of them is by blending into a composite figure people who possess a common characteristic, just as we saw occurred in the post-convulsive state. Referring to this feature of the dream, Freud (12) says: "Such a composite figure resembles A in appearance, but is dressed like B, pursues some occupation which recalls C, and yet all the time you know that it is really D."

Psychoanalysts, however, consider that the process of fusion operates much more widely than in dreams. Jones (20) says: "The tendency of the primitive mind—as observed in children, in savages, in wit, in dreams, insanity, and other products of unconscious functioning—to identify different objects and to fuse together different ideas, to note the resemblances and not the differences, is a universal and most characteristic feature, though only those familiar with the material in question will appreciate the colossal scale on which it is manifested. It impresses one as being one of the most fundamental and primordial attributes of the mind." Jones thinks that the process of fusion aids adjustment to reality. He says: "Appreciation of resemblances facilitates the assimilation of new experiences. If we can relate the new experience in some way to what is already familiar, then we can 'place it' and understand it; it becomes intelligible. The whole meaning of comprehension and explanation is the referring of the unknown to the known. In this way the process of fusion or identification aids our grasp of reality and makes it possible to deal with it more adequately."

There is, thus, some evidence that the principle of fusion, like that of regression and of repetition, is not confined to the convulsive process.

Conclusion

In our discussion we have wandered a long way from epilepsy, and the time has come to crystallize our ideas and ask ourselves what conclusions we have reached. We have singled out for examination three features of neuromuscular functioning exhibited during a general convulsion: dissolution or evolutionary reversal, repetition and fusion. Two of these, repetition and fusion of movement, are fairly obvious, but the third, recapitulation of a foetal pattern of behaviour, will only appeal to those who subscribe to Coghill's theory of development. It is, of course, not a new idea to suggest that an epileptic fit represents a return to the foetal level of evolution, for this was maintained by Pearce Clarke in the United States as far back as thirty years ago.

It is possible to demonstrate in the confusional state which follows a therapeutic fit the continued operation of the three mechanisms in question. One of these, repetition, manifests itself in both psychic and somatic spheres, while all three appear to dominate post-convulsive thinking. Only a few illustrations have been mentioned, partly because the subject has been dealt with elsewhere (23, 24), and partly because convulsion therapy

is so widely employed that it is a relatively simple matter to confirm or refute the existence of the mechanisms in question. The writer has, however, investigated the post-convulsive state on 430 occasions in 110 patients undergoing convulsion therapy.

Proceeding further, we found evidence of evolutionary reversal, repetition and fusion over a wide and diversified field of nervous and mental activity, normal and abnormal. These mechanisms, therefore, are not peculiar to the convulsive process, but present themselves under other conditions of nervous functioning. They appear in many guises and at different levels of integration.

The suggestion is advanced that a convulsion represents a neurological stress reaction; a reversion to a foetal level of nervous functioning in the face of a difficult internal (and sometimes external) environment. It is interesting to note, therefore, that similar mechanisms are brought into play under conditions of well-defined nervous disability, or where a strain is put on psychic adaptation. The argument is that these mechanisms, as manifested in the convulsive process, represent primitive prototypes of regulatory principles which participate in normal nervous and mental functioning.

Evolutionary reversal, repetition and fusion contribute towards functional homogeneity in both somatic and psychic spheres. This appears to be the overriding principle which governs the nervous and mental reactions of the organism in its struggle to maintain adaptation. In a general convulsion, where so much of the musculature is behaving in the same way at the same time, the reduction from heterogeneity to homogeneity is particularly obvious, but the same tendency is apparent at higher integrative levels. The movement towards homogeneity in the service of adaptation can be traced in two dimensions: those of Time and Space. When past patterns of behaviour and thought are reactivated, as it is claimed occurs during a convulsion, they intrude upon, combine with, or replace those of later origin. Thus, separation in Time ceases to exist. It is the same in the dimension of Space, for in a convulsion there is a unification of movement with a temporary abolition of limb segmentation (and, therefore, of limb-joint movement), while in the post-convulsive state the individual fails to distinguish clearly between himself and his surroundings, or between individuals and objects in his surroundings. This unification in Space, as in the case of Time, applies to both the objective features of the convulsion and the subjective experiences of the patient after it. However, fascinating though the subject is, consideration of spatial de-differentiation has had to be omitted from the present paper.

The reduction from heterogeneity towards homogeneity in the course of nervous and mental illness should not be regarded as a passive process, a mere release of lower functions from previous control by higher ones, but an active response of the living organism, or what is left of it by disease or injury, to pressure from the environment.

The writer would like to think that some of the views expressed here harmonize with those long held by the distinguished neurologist Goldstein (13), but he has hesitated to refer to the latter's writings through fear of unwittingly distorting their meaning.

Summary

1) A general convulsion has been considered from three clinical aspects: dissolution or evolutionary reversal, repetition of movement, and fusion of movement. These are interpreted as reactions to neurological stress.

2) In the confusional state which follows therapeutic convulsions the continued operation of these three mechanisms has been noted: repetition in the field of behaviour, and evolutionary reversal, repetition and fusion in the psychic sphere.

3) Attention has been called to a number of nervous and mental conditions, normal and abnormal, in which one or other of the three mechanisms plays a part.

4) The three mechanisms contribute towards the achievement of functional unification or increased homogeneity.

BIBLIOGRAPHY

1. Barcroft, J.: *The Brain and its Environment.* New Haven: Yale University Press, 1938.
2. Barcroft, J., and Barron, D. H.: *J. Comp. Neurol., 70:* 477, 1939.
3. Barcroft, J.: *Nature, Lond., 147:* 762, 1941.
4. Bartlett, F. C.: *Remembering.* London: Cambridge University Press, 1932, p. 219.

5. Brickner, R. M., Rosner, A. A., and Munro, R.: *Psychosom. Med., 2:* 4, 1940.
6. Coghill, G. E.: *Anatomy and the Problem of Behaviour.* London: Cambridge University Press 1929.
7. Coghill, G. E.: *Arch. Neurol. & Psychiat., 21:* 989, 1929.
8. Dunbar, H. F.: *Emotions and Bodily Changes.* New York: Columbia University Press, 1954.
9. Freeman, W.: *Human Biol., 1:* 406, 1929.
10. Freud, S.: *Beyond the Pleasure Principle.* London: International Psychoanalytic Press, 1922, p. 43.
11. Freud, S.: *Interpretation of Dreams.* London: George Allen & Unwin, 1921.
12. Freud, S.: *Introductory Lectures.* London: George Allen & Unwin, 1922, p. 144.
13. Goldstein, K.: *The Organism.* New York: American Book Co., 1938.
14. Head, H.: *Aphasia and Kindred Disorders of Speech,* Vol. 1. Cambridge, England: University Press, 1926, p. 510.
15. Irwin, O. C.: *Psychol. Rev., 39:* 189, 1932.
16. Jackson, J. H.: *Selected Writings,* Vol. 1. Edited by J. Taylor. London: Hodder & Stoughton, 1931, p. 273.
17. Jackson, J. H.: *Selected Writings,* Vol. 1. Edited by J. Taylor. London: Hodder & Stoughton, 1931, p. 354.
18. Jackson, J. H.: *Selected Writings,* Vol. 1. Edited by J. Taylor. London: Hodder & Stoughton, 1931, p. 415.
19. Jackson, J. H.: *Selected Writings,* Vol. 2. Edited by J. Taylor. London: Hodder & Stoughton, 1931, pp. 1–28.
20. Jones, E.: *Papers on Psychoanalysis.* London: Balliere Tindall & Cox, 1948, p. 105.
21. Levin, M.: *Arch. Neurol. & Psychiat., 73:* 139, 1955.
22. Penfield, W., and Jasper, H.: *Epilepsy and the Functional Anatomy of the Brain.* London: J. & A. Churchill, 1954, p. 215.
23. Power, T. D.: *The Mechanism of Convulsion Therapy.* Published Privately, 1942.
24. Power, T. D.: *Psychosom. Med., 7:* 279, 1945.
25. Power, T. D.: *Brit. M. J., 2:* 1092, 1950.
26. Power, T. D.: *J. Nerv. & Ment. Dis., 121:* 535–544, 1955.
27. Russell, W. R.: *Brain, 69:* 291, 1946.

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COMMITMENT OF THE MENTALLY ILL: "TREATMENT" OR SOCIAL RESTRAINT?

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"The ideal State is that in which an injury done to the least of its citizens is an injury done to all."

SOLON

INTRODUCTION

There are numerous facets of contemporary American life upon which psychiatry and law simultaneously impinge. First thoughts in this connection usually turn to criminology, delinquency and the problem of so-called sexual deviations. Indeed, the issue of "criminal responsibility" and other related notions which pertain to serious anti-social acts have aroused so much interest—probably by virtue of the sensational cases in the daily press—that the attention of psychiatrists and of others seems to have been distracted from other areas where psychiatry and jurisprudence meet. While these other meeting-grounds of the two disciplines involve situations which may be considerably less sensational than the headlined stories of crime and violence, they may provide us with valuable insights into the role and function of psychiatric concepts as they are applied in certain legal situations. Inquiry along these lines may also lead, in a roundabout manner, to a clarification of some of our ideas about mental health and disease.

In this essay I propose to consider the commitment of patients to mental institutions. The social significance of commitment procedures is clearly considerable. This is so partly because of the frequency of the phenomenon and partly because of the serious loss of civil rights which the procedure entails.[2] Moreover, socio-psychiatric studies of the very operations of psychiatrists in legal situations appear to be necessary, at present, not only from a point of view of scientific interest but also as a safeguard against confusing those aspects of psychiatry that aim at scientific knowledge with those that aim at social control.[3] These two activities, as I have emphasized elsewhere (27, 28), constitute two distinct areas of thought and action. In this respect, psychiatry is no different from other sciences and their social representations (e.g., physics and the American Physical Society as a group organized for certain social actions).

It is my belief that both scientific and moral progress depend upon a careful separation of social situations based on science and oriented toward scientific aims, from others based on, and oriented toward, ethics. Only in this way does science become free of the prejudice of moral judgments, a condition that has been hailed by all modern thinkers as a *sine qua non* of scientific progress. Similarly, I believe it would be desirable for the progress of humane ethics to have the legal rules of conduct—which in a secular society embody the prevailing moral precepts—freed of the jargon of pseudo-science. The law would then be exposed in a more naked form for what it is—or, perhaps better, for what appears to be a useful way of viewing it—namely, the rules by which the social "game of living" is conducted (26). Legal rules so expurgated of sentimental morality, it may be added, do not necessarily lose their social effectiveness.

COMMITMENT: THE SOCIALLY SANCTIONED AND ENFORCED HOSPITALIZATION OF THE "MENTALLY ILL"

Commitment may be defined as the involuntary but socially sanctioned and enforced hospitalization of the "mentally ill". While the fact that such confinement takes place against the patient's wishes is evident, it is

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[2] According to Davidson over 200,000 patients are committed annually in the United States (7, p. 184).

[3] For a provocative critique of psychiatry as a form of social control, see two of Bertrand Russell's recent writings (22, 23). The British novelist Nigel Dennis recently published a brilliant satire of modern psychotherapy (9). Their criticism and warning stand in significant contrast to the warm reception that was accorded to Freud's early work by many of the foremost literary figures of his time.

usually ignored or minimized in discussing the subject. Instead, the assertion that the hospitalization is for the patient's ultimate benefit is usually emphasized. Examination of writings on this subject shows that it is difficult to disentangle emotional biases and declarations of moralistic intentions from social and psychiatric facts and principles. It is important to note, in this connection, that several of the modern textbooks of psychiatry do not even mention commitment procedures, as if this matter were completely inconsequential. Others discuss commitment by citing the voluminous details of differing legal practices and thus bury the whole problem of the principles underlying this social phenomenon under a mass of juristic data.

In this essay, no attempt will be made to set forth or to explain the medico-legal rules *per se* which pertain to commitment proceedings. Rather, an analysis of these very rules forms the subject matter of our inquiry. Accordingly, we shall focus partly on the social and psychiatric facts which can be discerned in the actual operation of these rules and partly on the principles which underlie the social phenomenon as a whole.

Comments on the psychiatric literature on commitment

Neither Noyes (18) nor Masserman (17) mentioned commitment in their recent textbooks of psychiatry. This is particularly striking since the former author has occupied the position of superintendent of a well-known state hospital for several decades and in this capacity has dealt predominantly with patients whose hospitalization was, at least initially, forced upon them. A comparable phenomenon in the framework of individual psychotherapy would constitute an overwhelmingly significant aspect of the therapeutic (an observational) *situation* and would not long go unnoticed.

The most forthright presentation of this subject that I was able to find was written by Henderson and Gillespie (14). They noted that it is general custom at the present time to try to induce the patient to accept hospitalization voluntarily. In such instances the issue of commitment does not arise. This is our first clue, and it should put us on guard that perhaps the psychiatric ("diagnostic") condition of the patient—as a scientific abstraction—is not the most relevant factor in determining whether or not he might be a candidate for commitment. Indeed, Henderson and Gillespie state this directly:

> "Apart from the medical side, the social and economic circumstances are often deciding factors for and against certification. Certification is desirable where no adequate accommodation at home or in a special nursing home is available, or where money is a consideration. Certification is unnecessary where adequate arrangements for treatment can be made outside of mental hospitals, and undesirable where the patient occupies an important public position, e.g., director of a company, partnership, etc." (14, p. 684).[4]

If the foregoing statement were taken with the seriousness which it deserves, the conclusion would follow that commitment is a matter of social and economic *power* (21) and has little to do with psychiatry as a science. That such, indeed, is largely the case I shall try to document further in this essay.

The psychoanalytic literature has grown to a respectable size during the past decades, yet it contains no consideration of the problem of commitment. Committed patients are not as a rule the subjects of psychoanalytic treatment proper, and this in part may account for their neglect by analysts. Many such patients, however, have been approached by "psychoanalytically oriented" therapies; still their committed status has never been considered as a fact worthy of special notice.

Recently two psychoanalysts writing on related subjects presented views which are pertinent to our topic. Linn (16) discussed various aspects of forensic psychiatry and also some social and legal aspects of sexual deviation. He noted that individuals often

[4] Note the contradiction between the foregoing quotation and what Davidson said in commenting on "The Proposed Model Commitment Law": "Hospitalization proceedings should involve a maximum reliance on medical judgment. The *basic question* in deciding whether a person should be hospitalized is his health and his medical needs. The model law follows the current trend of placing major emphasis in any admission procedure on the conclusions of qualified physicians who have examined the patient" (italics mine; 7, p. 181). The hypocrisy of the latter suggestion—namely, the importance of the physician personally examining the patient (6)—is borne out further by the unhesitating abandonment (by forensic psychiatrists) of this principle in the retroactive determination of testamentary capacity (30).

lost many of their legal rights when they became patients in a mental hospital and then added:

> "These rights are taken from them in the words of the Iowa Supreme Court 'to aid and assist the individual, to provide means whereby the state may protect its unfortunate citizens, to furnish hospitalization so that the insane will have an opportunity for rehabilitation and readjustment into *useful* and *happy* citizens. It is not a criminal proceeding in any way. The restraint placed upon them is only until they have recovered so that they may again take their places in the communities from which they came. The confinement is *not intended* as a punishment but solely and only to provide the mentally sick with that environment which may possibly cure the disease and return them to society as useful citizens.' One might wish to add that we also take into consideration the dangers to society which sometimes ensue from the actions of the mentally sick, although admittedly the importance of this factor has often been exaggerated, and it may certainly be given second place in our thoughts" (italics mine, 16, p. 420).

Linn did not scrutinize this avowedly do-goodish pronouncement of the Iowa Supreme Court and seemed to accept it as a valid statement about commitment. To me this position seems misleading and quite devoid of scientific value. Furthermore, repeated assertions that commitment is *not* punishment betray the real social impact of this mode of handling people. What seems to be the essence, from a socio-psychological point of view, of Linn's foregoing statement? Could it be, perhaps, that it is nothing more than a justification on society's part (that is, on the part of those who hold power) for demanding and exacting a certain "role-behavior" from among those of its members who have less power (4)? Note the emphasis that the psychotic should be restored to usefulness and happiness. In former times the same goals were set for slaves. Even today, by substituting Negroes for the mentally ill and segregated social situations for mental hospitals, the text becomes indistinguishable from a southern white-supremacy manifesto. I shall return subsequently to this matter, that is, the nature, motives and effects of the disenfranchisement of people under the banner of "mental illness". For the present, I only want to call attention to the unfortunate fact, all too often forgotten, that throughout recorded history those in power have justified their behavior towards those less powerful by claiming that various social actions were to the latter's benefit. This, for example, was the traditional attitude toward slaves and the conversion of the "heathen". It seems regrettable that in modern times psychiatry and psychiatrists may have adopted the same sort of attitude in their relationship to certain classes of human beings.[5]

In his discussion of "mental illness and loss of personal liberty", Linn stated:

> "It is perhaps ironic that commitment laws which were originated to prevent "railroading" function primarily in our day to forestall the ill-advised removal of patients from mental hospitals by disturbed relatives. In any event, what survives, or what should survive in these laws, is a dedication to the welfare of the patient" (16, p. 421).

To my knowledge there is no evidence, and Linn presents none, to show that commitment laws were originated to prevent the illegitimate confinement of people in institutions under the guise of "mental illness". The alleged dedication of the law to the welfare of the patient is precisely the sort of platitude which I mentioned above and which was invoked for centuries—in ancient Greece, in medieval Europe and until recent days in some southern states in America—in regard to the judicial status of slaves.

In general, Linn appears to be identified with the social aspirations of the culture in which he lives and sees no essential conflict between serving it and his patients. The following passage illustrates his attempt to reconcile, smooth over, or deny the possibly conflicting needs of society and patient.

> "In general, proceedings to commit a patient are initiated at the request of relatives or other

[5] Compare this, by way of contrast, with the following statement concerning the legal rights and obligations of the blind as formulated by Edmond Cahn: "In the law's appraisal, a blind man is not of a different species from one who has the sight of his eyes. A blind man is simply another member of the total society; he must take suitable and reasonable precautions for his and others' safety. So must a man who is too short, or too heavy, or whose reflexes are slowing with the years; so also must every one of us.—Persons who are afflicted and disabled must not be categorized even by themselves as an inferior or pitiable species. They are, on the contrary, men in all essentials like their neighbors—with the needs, duties, dignities, and singular potentialities of the genus" (3, pp. 220–221).

> *responsible* individuals in the form of a petition. The patient is then examined by one or two doctors to ascertain if he is a *danger to himself or those about him.* If so, they complete a certificate which endeavors to explain to a court of law why it is necessary to deprive the patient of his liberty. The patient is then brought to a court hearing at which time judicial approval may be given or withheld at the judge's discretion. If the doctors feel that the appearance of the patient in court may be detrimental to his health, this appearance may be waived in many states. *In fact, court approval is usually given as a matter of routine on the basis of the considered opinions of properly qualified physicians.* The responsibility for a psychiatric patient's treatment begins in the psychiatrist's initial contact with him, even when this takes place during a commitment proceeding. Any semblance of a punitive attitude should be avoided. The existence of quasi-criminal proceedings for the hospitalization of the mentally ill is a holdover from the dark ages when thousands of *innocent* people were burned at the stake because of symptoms clearly recognizable today as manifestations of *mental illness*" (italics mine, 16, p. 422).

Elsewhere, discussing sexual offenders, Linn wrote:

> "Some sex offenders . . . inflict physical and emotional trauma upon those about them. Others, at worst, have only a nuisance value to society. *This purely sociologic consideration should be the basic frame of reference for the psychiatrist in advising the court.* For example, a rapist may be *less sick* than a peeping tom from a clinical psychiatric point of view, yet sociologically the rapist is a menace and the peeping tom but a nuisance" (italics mine, 16, p. 314). "The responsibility of the psychiatrist to educate the uninformed and to deal scientifically with public hysteria is apparent. A dispassionate evaluation of each case is most likely to protect the mental health of the community" (16, p. 315).

The fact that court approval is usually granted routinely on the basis of medical testimony regarding the alleged need for commitment signifies that by so acting physicians fulfill a special social role, unrelated to their technical knowledge (27). Accordingly, by entering into this legal situation, the physician (psychiatrist) acts in the role of one of society's agents whose duty it is to enforce compliance with certain social rules. I want to emphasize that this may be an entirely "legitimate" and morally defensible role, similar to the roles, for example, of policeman and judge. It is, however, scientifically misleading to equate this role with that of an "individual therapist" vis-à-vis the patient.

Linn's explicit statement about the sociologic frame of reference that should govern the determination of court action against the sexual offender is another example of the multiplicity of roles which he assigns to the psychiatrist. If court action is to be determined in this way, then why not conclude that the psychiatrist has nothing to contribute to the proceedings? Judge and jury are by the very definition of our democratic society the official experts in deciding which modes of behavior are socially unacceptable. If further "scientific" embellishments are needed, why not summon a sociologist or cultural anthropologist? Surely, these scientists know more about social issues than do doctors of medicine—who need not even be psychiatrists—who are, however, legally empowered to decide about "insanity". It is interesting to note, in this connection, that examination of older texts of psychiatry reveals that the procedures for commitment, as well as its justifications, have hardly changed at all during the past 60–70 years (24). The only change is a semantic one. "Mental illness" is now substituted for "lunacy". This verbal switch is often mistakenly regarded as a significant step toward a more rational handling of this matter.[6]

As a concluding comment on Linn's view on commitment, I want to list the various roles or social positions which he assigned to the psychiatrist. They are: 1) an expert diagnostician who must determine whether an individual is a "danger to himself and others"; 2) a qualified sociologist; 3) a representative of society's best interests and a protector of its "mental health"; 4) an "educator of the uninformed"; 5) a "scientist" who deals with "public hysteria"; and finally, 6) a personal

[6] A striking example of the role of this Orwellian mechanism in psychiatric thinking is displayed by the report on "Commitment Procedures" of the Group for the Advancement of Psychiatry (12). In this report it is stated: "The Committee believes that all statutes should delete the term 'commitment' in place of which should be substituted the term 'certification'; 'insanity' and 'lunacy' should be replaced by the term 'mental illness', and the terms 'feeble-minded' or 'weak-minded' should be abandoned. The Committee believes that the term 'parole' should be abandoned and in its place the term 'convalescent status' or 'convalescent leave' should be substituted" (p. 3). It is difficult to see how such verbal changes would benefit the patients. A jail is a "jail" even if the prisoners are well treated. It is easier to see that the changes suggested would make the psychiatrists in charge of hospitalized patients feel better by deemphasizing the degree of control over the patients which they exercise (29).

therapist for the patient. Linn implied that there was no inherent conflict in these diverse roles and that it was possible for the psychiatrist to fulfill all of them simultaneously and satisfactorily. I have suggested and documented that there is evidence to the contrary (26).

Let us now turn to what Stanton and Schwartz said about this subject in their recent book (25). These authors, one a psychoanalyst and the other a sociologist, do not explicitly discuss commitment. This procedure, as a formal legal step, is usually avoided in the hospitalization of psychotic patients in psychoanalytically-oriented private sanatoria. The same issue, however, arises in connection with conflicts which sometimes occur between the best interests of the community, on the one hand, and the patient, on the other. Stanton and Schwartz devoted a section to the "Protection of the Community" and concluded their discussion with the following paragraph:

> "But, however much or little he knew about the community, *the psychiatrist either submitted to being an agent of the community or he abandoned work with the really seriously ill. He had no other choice.* The community had strong and effective techniques of maintaining order; it might be stupid or enlightened, brutal or friendly, closely integrated with the hospital or distant, and occasionally it was all of these. But it protected itself. The license for the hospital to operate was granted by the town government and had to be renewed each year. There was never any serious question about its renewal, but the license dramatized the fact that, regardless of the personal values of the psychiatrist, protection of the community would take priority over the therapeutic purpose of the hospital, if there was an obvious conflict between the two. The hospital had to be successful in this purpose, and it was" (italics mine, 25, p. 48).

The candor with which Stanton and Schwartz described this matter is characteristic of their whole approach to the analysis of the social role and function of the mental hospital as an "institutional participant" in psychiatric illness and treatment. In agreement with their foregoing statement, it is my thesis that in committing a patient to a mental hospital, the physician's essential role is that of an "agent of the community". This role may or may not conflict with his role as therapist (that is, an "agent of the patient"). No facile generalization about this potential conflict of interests is permissible.

Commitment from the viewpoint of life as a game

Before outlining briefly what appear to me the essential principles underlying the commitment procedure, I want to indicate the inadequacy of the usual reasons which are put forward to explain and justify it. The usual reasons given for committing a person are 1) he is psychotic; 2) he is dangerous to himself; 3) he is dangerous to others, and 4) he needs hospital care and "treatment" but lacks appreciation for this need.

Each of these reasons contains a germ of truth, but certainly no more than that. Yet each factor, by itself, is patently inadequate as an explanation, and even all four in combination do not relate to the essential features involved in this social phenomenon. First, the psychotic state of the individual is clearly an insufficient criterion since it is generally known and acknowledged that there are many such persons at liberty in society. "Psychotic" is used here in a scientific-diagnostic sense. To give this word any other meaning only compounds our difficulties. As to the question of the patient's dangerousness—to himself and others—this is undoubtedly the most relevant consideration. Yet, here too, the statement in its customary form is logically so loose and all-inclusive as to be without value either as a definition or as a rule of conduct (regarding commitment).

For instance, a so-called "model act" governing hospitalization of the mentally ill states:

> "The court may not order hospitalization unless it finds that the person 1) is ill and likely to injure himself or others if allowed to remain at liberty, or 2) needs hospital care but lacks sufficient insight or capacity to make a rational decision with respect to hospitalization. A person who is not dangerous or incapable of making a rational decision for himself, even though he may not be wholly sane, retains the freedom to choose for himself whether to go to a hospital or not" (13, p. 311).

The real issue is not so much whether the person is dangerous to himself and others, but rather *who he is* and *in what way he is dangerous*. In other words, as Balint (2) clearly pointed

out in relation to the problem of crime, social rules are usually stated in a prohibitive form but contain implicitly permissive equivalents. He thus paraphrased one of the Commandments as follows:

> "Certain persons must not be killed or injured. (Others may.)" (2, p. 254)"

Similarly, the matter of dangerousness may be restated in this form: "One must not threaten or inflict injury upon oneself or others in certain (specified) ways. (Other patterns of injury, or threatened injury, are permissible.)

Violation of the former rule may invoke social action against the violator in the form of commitment. The permissible forms of dangerousness are often rewarded (e.g., daredevil circus performers, etc.).

In addition to defining clearly the forbidden and permissible ways of being dangerous, it is also necessary to specify the social position of the participants. In other words, we must ask, "Who is dangerous to whom?" To be accurate, the rule must read as follows: "The safety of certain persons must not be threatened. Others may be endangered with legal immunity."

Similar social relativity pertains to the person who constitutes the danger (5).

The fourth and last point, which is the alleged need for hospital care and treatment, touches on considerations similar to those that have already been mentioned. Here it is necessary to specify the social position of the potential patient, on the one hand, and of the judge who determines the "need for hospitalization", on the other. Without such specifications, the statement is nothing more than a deceptively reasonable-sounding platitude which usually effectively disguises the very problem which I propose to analyze in this essay.

Some aspects of the view about commitment which I wish to propose have already been touched upon in a fragmentary manner in connection with my comments on the literature and on the so-called standard explanation of this procedure. I shall now try to bring together these fragments in a brief and concise summary which will express my thesis of the socio-psychological function of commitment.

To begin with, I propose to view commitment in a manner similar to that in which I have approached some other judicially-regulated types of social behavior, that is, in terms of the socio-psychology of games. In these terms, ***commitment will be seen to be a form of social restraint employed against certain persons who violate certain rules.*** I shall endeavor to describe accurately the social position of persons so restrained and the rules which they violated.

Let us focus first on the modes of *behavior* which may, under certain circumstances, invoke commitment. In a general way, such behavior must appear "abnormal" in a social sense. In other words, it must appear unusual to the majority of people or relative to the "average idea" prevailing in society of what constitutes "rational" behavior. Such behavior is not directly correlatable with the psychiatric notion of any diagnosis, although in many cases what is socially offensive *coincides* with what the psychiatrist calls psychotic (or schizophrenic). Yet the fact that these two concepts—that is, "psychosis" and "behavior which leads to commitment"—overlap in an irregular fashion cannot be emphasized too strongly. Psychotic individuals are left undisturbed as long as they do not annoy someone (of some importance) to a sufficient extent to mobilize action against them. The crucial factor in this context appears to be the issue of creating a *social disturbance*. In other words, a person must lay claim to *ideas* or *beliefs* which threaten society, or must commit *acts* which violate social rules, before he becomes a candidate for commitment. These considerations underscore the significant similarities that exist—from a point of view of social structure—between the problem of "insanity" and "crime". Whether punitive or therapeutic *intentions* are espoused as the motives for the offender's restraint becomes irrelevant from the point of view proposed here.

Some illustrations will document these assertions. Religious beliefs and scientific ideas are important in all cultures and play a similarly significant part in furnishing the content of many psychotic states. In our culture, it is generally accepted that "God exists". Those who pray to him are looked upon as respectable, virtuous and sane. Yet, those who claim that a communication pattern is in operation in the reverse direction, namely, that God is

talking to them, are generally regarded as deluded and may be segregated from the rest of the population. To speak to God is all right, but to hear him is not. Certain exceptions obtain even in this case. For example, the Pope can claim that he receives divine messages without violating the social sense of what is normal. We shall discuss the inferences to be drawn from this fact later, namely, the immunity of those occupying the highest positions of power in a social structure from the rules (laws) which govern the (less powerful) majority.

Stating this another way, we are simply asserting the commonly accepted view that no idea or belief is a "delusion" in a vacuum. The concepts of delusion and hallucination imply processes of *validation*. Unfortunately, social custom is often unconsciously accepted as *the norm*, as if it were an objectively given fact rather than merely a social convention.

Similar considerations pertain to the validation and judging of overt acts. In this context too it is a matter of social convention—and often a rapidly changing one at that—as to which modes of behavior are regarded as "normal", which as "criminal", and which others as evidence of "mental illness" (28). Specifically, the prohibition against dangerous acts towards oneself or others—under penalty of commitment—applies only to those situations which are considered by general opinion as outlawed (or peculiar, "crazy", "sick", etc). For example, one must not be dangerous to oneself by an overt attempt at suicide. A covert attempt, not so interpreted by *popular opinion*—such as, for example, exposing oneself to a traffic accident—is within the bounds of normality. Certain other modes of endangering oneself may be even admired and rewarded, such as being a trapeze artist or a test pilot. In regard to being dangerous to others, here again the issue is not the mere fact of "being dangerous", but rather in being so in a manner expressly disallowed by society.

In addition to the behavior being annoying in certain ways, the issue of commitment also depends on the social roles of the persons involved. Indeed, the essential problem can be formulated by asking the question, "Who annoys or disturbs whom?" In answering this question it becomes clear that commitment is a social procedure which is dependent on a social hierarchy organized in terms of power. In other words, only if someone of lesser power annoys someone of greater power (in the specified ways discussed) is the issue of commitment raised. Those members of society who occupy the higher echelons of power are, as a rule, immune from this form of confinement and loss of civil rights. It is worthy of emphasis, in this connection, that psychiatry and its practitioners, in so far as they lend a helping hand to the enforcement of this procedure, perpetuate a system of social judgment which, in actual operation, is far more discriminatory against certain groups and classes than is the general machinery of law-enforcement in a modern democratic society.[7] Thus, poor and rich, bank president and ditch-digger, are all treated (more or less) alike when they violate the rules (laws) which govern motor vehicle traffic, taxation or homicide. Not so, when their respective behavior violates the rules which lead to the notions of "insanity" or "mental illness". In the military situation, for example, where the hierarchy of power is clearly defined, it is common for officers to send enlisted men to the hospital for "psychiatric observation". This is a way of saying that, "This man is (probably) crazy . . . ." The converse of this situation is, of course, ludicrous. No enlisted man can openly entertain the possibility of a psychiatric disorder in his superior officers. In addition to this, the mere existence, in official files, of a psychiatric diagnosis spells the end of a military career for an officer. To insist on the alleged similarities between medical and psychiatric "illness", in the face of such evidence, is an exercise in a socially approved mode of denial.

It may be objected that the social judgments currently associated with a psychiatric diagnosis are not specific for them since similar sentiments were associated until recent times with the diagnosis of, for example, venereal disease. This objection would miss the point

[7] See in this connection Kecskemeti's important examination of the nature of ethical principles and behavior wherein he remarked that:

"The moment 'principled' behavior is taken to imply the assumption that one group alone can do or suffer wrong, it ceases to be ethical behavior; and those who act on such maxims betray the principle of the open society, no matter how righteous and progressive they consider themselves to be" (15, p. 312).

that I try to make by deflecting attention from our considerations to the similarities which do obtain between these two phenomena but which are confined to the social judgment *about* having such diseases (i.e., for purposes of specific comparison and contrast, let us say syphilis and schizophrenia). The differences between them are, however, more significant and are chiefly the following: 1) The criteria for diagnosing syphilis rest on observations of the *body*, those for schizophrenia on observations of *behavior*; the former require the methods of physics and chemistry, the latter those of psychology and sociology. 2) The diagnosis of syphilis was established regardless of the social positions of physician or patient (assuming the technical competence of the physician). This statement does not hold with equal validity for the diagnosis of schizophrenia. 3) Dermatologists, syphilologists and other physicians interested in venereal diseases did not make it their chief concern to enter into the social arena of value judgments and did not try to mitigate the popular condemnation of these disorders by insisting that they are at bottom no different than say pneumonia. Instead, they concentrated on scientific work in this field, whether of a bacteriological or of a sociological nature (e.g., the influence of prostitution on venereal diseases). With changing social orientations toward sexual activity, together with the development of more effective therapeutic agents for syphilis, the former attitude of social condemnation toward this disease has changed markedly. This was accomplished without any semantic changes in the words "syphilis" or "venereal disease". Contrariwise, in the field of mental illness, particularly in its relation to commitment procedures, there seems to have been more emphasis thus far on combating popular opinion by switching to new words and less emphasis on scientific exploration of the problem area proper. It is my impression that in such situations the pursuit of scientific work itself is one of the most potent social forces that can be brought to bear on the problem and that it invariably leads, albeit indirectly, to alterations in popular opinions and prevalent social judgments.

Outside of the military situation, the role of power-status in relation to commitment (and psychiatric illness) may be illustrated as follows. In the school-situation, teachers and administrators may regard some students as constituting "psychiatric problems" and may, at times, recommend psychiatric treatment. Courts of law do likewise. In these circumstances, once again, the reverse procedure is not allowed. Similarly, in the framework of the psychoanalytic training system, representatives of the latter may suggest to, or may bring various pressures to bear on, students to continue, or to resume anew, their personal analyses. This, too, is not a reciprocal situation. All of *these examples are intended to underscore the concomitance, from a sociologic point of view, of "mental health" and social power.*

It is interesting to note that certain variations or exaggerations of that pattern of belief or action which society officially regards as "good" are precisely those most feared; whereas those modes of behavior which are officially viewed as "bad" are often much more permissively tolerated. The former phenomnon is illustrated by the social status of religious belief; the patient with so-called religious delusions—for example, the belief of being Jesus Christ or of hearing God's voice—is usually regarded by psychiatrists as very dangerous. One hears this fear supported by the question: "How can you be sure that God will not tell him to kill someone?" (We touch here on a matter which has some important implications for our understanding of the nature of religious belief.) Conversely, the use of alcohol is officially condemned. Yet, the danger which intoxicated drivers constitute vis-à-vis society is accepted in a rather matter of fact fashion. Certainly, statistics would no doubt substantiate the impression that drunken drivers kill and injure many more people than do persons with paranoid delusions of a religious coloring. All this is common knowledge, and perhaps it will be thought that I belabor this discussion with trivialities. I repeat, therefore, that my reason for mentioning examples such as these is to document the fact that persons are *not* simply committed *because* they are "dangerous to themselves and others" as physicians daily testify.

A final and perhaps overly crass illustration of this thesis is found when these concepts are applied to political figures. Hitler, for example,

was considered "normal" in Germany when he was in power. In the United States many people—well-known psychiatrists as well as lay persons—asserted that he was "paranoid" and "should be locked up". Not only were the latter free of Hitler's power, but it was implicit in their judgment that they were not in sympathy with his political aspirations.

It may be argued that the relevance of social position, particularly as it pertains to power, to the notions of mental health, illness and commitment, is not novel and is well known and appreciated. This may be true, and I am prepared to admit it. If it is true, however, then we must acknowledge that by lending a hand to this sort of quasi-scientific use of psychiatric concepts, we, as psychiatrists, support and perpetuate an irrational and, from a democratic point of view, immoral system of human relationships. Psychiatrists often retreat behind the saying that "insanity" is a legal concept, and that commitment is a legal procedure. Substituting "mental illness" for the former does not really alter matters. And as to commitment, the possibility must be raised as to whether it would not serve the interests both of potential patients and of our science better if psychiatrists would make it a rule not to enter into actions which either diminish the "responsibilities" or take away the civil "rights" of particular members of our society (28).

A paradigmatic case history

In as much as this essay deals with phenomena which are a part of our everyday living, it is difficult to cite observations other than of a trivial kind. This means, on the one hand, that the data to confirm or refute my thesis are easily available to anyone who wishes to make the necessary observations; on the other hand, it might be argued that such observations are vague and ill-defined and that my thesis is neither more nor less plausible than is the official view of this matter. A pertinent clinical case—and one that is moreover at a *safe* historical distance from current events—furnishes a rare opportunity to document some of the observations and inferences suggested in this paper.

The case is that of King Ludwig II of Bavaria. The history of his psychosis and of his so-called commitment was set forth in a masterful fashion by Leo Alexander (1). For the sake of brevity, I will not repeat, nor even summarize, the historical narrative and will restrict my discussion to some comments on those aspects of this story which are relevant to our present inquiry. The King manifested the typical symptoms of what is today regarded as paranoid schizophrenia. A commission of four eminent psychiatrists met in June, 1886, and decided, on the basis of all sorts of evidence (not including, however, seeing the patient), that "the King was insane and incapable of carrying out the proper operations of government" (p. 101). The problem which now arose was naturally that of how to carry out the *actions* implicit in this diagnosis.

The commission tried to treat the King as if he were a psychiatric patient and tried to provide a supervised environment and treatment for him. The King, however, refused to be cast into this social role.

> "Since the commission (composed of four psychiatrists) had arrived without military escort in order to show respect for the King, and in order to eliminate any and all semblance of coercion, the commission then returned to Hochenschwangau for further consultation, without its purpose having been accomplished" (p. 101).

The wish to avoid showing *evidence* of coercion betrays the problem of power, discussed earlier. Alexander noted clearly that such action on the part of the commission might have, at this time, also proved physically dangerous to them.

Subsequently, the King was induced to move to Castle Berg which was converted into a make-shift psychiatric hospital for his exclusive use. While there, at an unguarded moment, he attempted to drown himself, and when his psychiatrist interfered, he killed him as well as himself.

At this point in the narrative, Alexander commented as follows:

> ". . . the major cause of the disaster perhaps was the basic attitude of making special concessions to a highly placed patient.—Removal of the King to a well-organized and well-staffed mental hospital would probably have been the better course" (p. 106).
>
> "After all, the basic reason for commitment is the expert's finding and conclusion that the patient does not have sufficient independent judgment to carry out his

affairs in his own best interests. Perhaps a great many other suicides of highly placed persons were not prevented because the same error was made as in the case of the sick King of Bavaria" (p. 106).

It seems to me that Alexander's inferences not only do not follow from the material at hand, but more than that, they obscure the essential sociologic facts and conclusions which must be drawn from this instructive case. I wish to call attention to the following considerations:

1. "Highly placed" patients are *always* treated with special concessions. This is true in cases of medical and surgical treatment also, and it is precisely these modes of treatment to which psychiatrists at the present time like to compare their own work.

2. Removal of the King to a mental hospital would have endangered, in a legal sense, those in charge of the hospital. The *fact* that it was not done must be regarded as eloquent evidence of something, namely, of the socially (legally) tenuous nature of this whole operation.

3. Alexander's statement about the "basic reason for commitment" is a restatement of the official view. The events sketched in his essay constitute vivid evidence—so I submit—to the contrary. Commitment, in such cases, either cannot be implemented, or it encounters very great difficulties which must be overcome by complicated judicial procedures.

To persist in maintaining that no force is used against the patient runs completely counter to the facts. (I do not imply by this that the patient is damaged, or that this ought not be done. I simply suggest an observation without ethical connotations.)

4. Lastly, Alexander's comment about the prevention of suicides in highly placed persons opens the door to a host of complicated moral and social issues. For example, if this method is to be used to prevent the suicides of powerful public figures, what about the prevention of *homicides* which such men can carry out on a national scale? It seems obvious that without recourse to some sort of supra-national morality and law-enforcement, such decisions will bog down in a hopeless relativism of social values.

It is interesting to note that in his discussion of this story Alexander touches on the problem of social status and power as this relates to psychiatric "diagnosis" and "treatment". Since he takes a quite different—almost diametrically opposite—position in this regard to the view which I propose, his pertinent comments should command our attention. He wrote:

> "I am reminded of an experience during the recent war when as a newly activated medical officer I was faced with admission to the ward of a suicidal Major-General. One of my assistants, a lieutenant, called our commanding officer, a regular Army Colonel, to ask if there were any special things we were to do in the circumstances. The colonel curtly replied: 'Take off his uniform and you will outrank him.' This was promptly done and the patient made an uneventful recovery under the right form of treatment in a ward which contained all ranks and which provided the best treatment facilities the Army can provide' (p. 106).

In my opinion, this illustration misses the point: the real issue in a case such as this revolves around the following factors. 1) Does the patient come to the psychiatrist on his own accord, or at least willingly, or not? We have no information on this question in the case of the suicidal general. 2) If he does not come to the psychiatrist willingly, then indeed there does arise the question of *who* will assign him to the social status—even if only temporarily—of a "psychiatric patient". Unless this is done by someone who does in fact outrank the patient, it exposes the accuser, so to speak, to the risk of being tried for insubordination, disobedience of orders, mutiny or some similar offense. The story of "The Caine Mutiny" (31) dealt with a dramatization of this sort of problem.[8] In any case, the fact remains that neither Alexander nor the lieutenant to whom he refers had in this case really encountered a power-problem in relation to psychiatry. At the juncture at which they had to deal with

[8] The impression that this excellent story represents an artistic dramatization of the problematic relationship of social power and mental illness is borne out by the fact that the crucial events which it portrays have never happened. In his introduction Wouk stated that, "The records of thirty years show no instance of a court-martial resulting from the relief of a captain at sea under Article 184, 185, and 186 of the Naval Regulations" (31, p. iv). This fact evidently did not detract from the popular appeal of the novel and of the film based on it. This, in turn, suggests the inference that although the events depicted are fictitious, they dramatize similar events in everyday life.

the general, he had already been "demoted", figuratively speaking, to the rank of "patient". It seems a valid generalization to assert that the social identity (9) of a "psychiatric patient" (or of being committed) can arise in only one of two ways: 1) Either it is accepted voluntarily by a person in the hope of achieving certain goals of his own, for the realization of which this social status is a necessary precondition, or 2) It is "stamped on" a person, unwillingly, by some powerful social body or its representative (judge, military psychiatrist, etc.).

One final observation about the problem of the psychiatric treatment, or commitment, of a highly placed person. If such a person seeks psychiatric help voluntarily—and under otherwise favorable circumstances—the patient's high social status need not present any special problems. If, on the other hand, the question of psychiatric intervention (treatment should not really be spoken of in such a case) arises in opposition to such a person's wishes, then—it seems to me—we are forced to conclude that we encounter what seems to be an *inherent limitation* of high social status (power). We have an innate prejudice against readily accepting such a possibility since most everyone thinks that the higher one gets in a social hierarchy, the more rights and opportunities this will afford. In other words, such a move upwards is thought of as all to the good. This, undoubtedly, is an incorrect view of the matter. For just as we take it for granted that poverty and the lack of certain civil rights are inherent evils of being in some low echelons of power in society, so it would seem that there are some other *inherent* limitations in positions of social power. I touch here on just one of these, namely, on the impossibility of being restrained and psychologically "treated" when, under otherwise similar conditions, a man of lesser social standing could be readily managed in this way, sometimes to his own ultimate advantage.[9]

Discussion

It was suggested that the customary reasons given for the use of commitment are inadequate and misleading. The justification of commitment as "treatment" for the patient was singled out for particular criticism: to assert that one does something to "help someone" makes it difficult to bring a scientific attitude to the examination of the relevant processes.

It is acknowledged that commitment may be socially necessary and useful as a way for the majority to protect itself from annoyances on the part of certain members of society. It seems to me, therefore, that geniune progress in the realm of the "major mental diseases" depends on a more open recognition of the fact that such persons are committed generally *not* for their own benefit but for the benefit of those whom they threaten or annoy. This does not imply that the enforced hospitalization might not, under favorable circumstances, be helpful to the patient. It only means that "treatment", in the ordinary sense of this word, is not its primary aim. By failing to recognize, in a forthright manner, the conflict inherent in the concepts of "treatment" and "social restraint", and the manifestations of this conflict in the actual social working of commitment procedures, psychiatrists and others push back the clock to much earlier modes of viewing human relationships. Analogies between commitment and some other social arrangements will illustrate this thesis further.

Persons with so-called "mental illness" are not the only ones who are, or have been, segregated from others. Consider, for example, the almost legendary role of lepers or, in recent times, the enforced segregation and treatment of patients with certain contagious diseases (tuberculosis, syphilis, etc.). In these cases, however, the matter has been dealt with much more honestly in that it was openly admitted that the segregation was not (primarily) for

[9] An illustrative example of the general principle suggested above is found in the common observation by doctors that members of physicians' families tend to get poor medical care. One frequently hears that all of the oddest and worst complications occur in such cases. It is clear that the difficulty here stems from the physician's inability to treat the patient as "just another patient". While the more "important" patient may get more "attention", the fact that he is not treated with the detachment with which the average patient is, often leads to a contamination of the "medical situation" and thus results in the complications of which one so often hears (19).

An interesting discussion of a related topic, namely, of the effect of great power on the personality organization of the political leader was presented recently by Devereux (10).

the patient's benefit but for the benefit of other members of society.[10]

The most important other group segregated from society is, of course, that labelled "criminals". The similarities and differences between the social moves adopted vis-à-vis criminals and the mentally ill could well form the subject matter of a separate study. I will confine myself to calling attention to the following considerations. Criminals are deprived of their liberty, and it is openly admitted that this is not for their benefit but for that of society. (Whether these measures "really work" has no pertinence here.) We say, therefore, that they are in "jail". Furthermore, such confinement can only be inflicted *after* the violation of a law. Commitment, on the other hand, pertains to a situation in which persons are deprived of their liberty allegedly for their own benefit. Society is thus forced into the semantic trick of asserting that such people are in a "hospital" (not in "jail") and are there, moreover, for "treatment" (not "punishment"). May I suggest that we consider the similarities between this modern approach to "mental illness", on the one hand, and the spirit underlying the medieval Crusades, on the other? The latter, as we know, were characterized by certain social actions—by one group against another—in such a way that those who wielded force claimed to have done so for the benefit of their partners. Clearly, this is of great help for the inner sense of right of those who feel impelled to *act*. By the same token, to call state hospitals "hospitals"—rather than "jails"—serves only, or mostly, to make society feel better.

Earlier I also compared the social situation of the committed patient with that of the slave. This analogy, too, suggests than an explicit understanding of this type of social interaction is a necessary prerequisite for real improvement in the status of a dehumanized class. If I am permitted to summarize the history of thousands of years of slavery in a few sentences, I would say that the following three steps have characterized the evolution and dissolution (in some parts of the world) of this type of human relationship.

1. First, there is the notion that the master-slave relationship is a "naturally-occurring" phenomenon. It cannot be anything but "good" for the slave. This state of affairs characterized Aristotle's Greece, Plato's Republic and Moore's Utopia.

2. Later, the situation is encountered in which it occurs to the masters that this arrangement might not be quite as good for the slaves as they had thought it was. Once the master starts to identify with his slave, the latter's misery (or assumed misery) becomes openly recognized. At this point refuge is usually taken in the "narcissism of the State": it is asserted that while slavery may be bad for the slave, it is *necessary* for social survival. In other words, slavery becomes good for society!

3. Gradually, this notion too becomes excessively guilt-laden for most people, and with a gradual change in social patterns the very concept of "slave", as a social fact, *disappears*.

It seems to me that there is much evidence to suggest that our orientation to the hospitalized "mental patient" comes close to reduplicating the first stage in this scheme. This is borne out by the insistence that commitment is for the patient's benefit, the use of such words as "hospital" and "treatment", and so forth. Consider further the violence of the "treatments", such as insulin and electric shock, lobotomy and now the new chemical "straight-jackets" (29), and the fact that so many of the patients *do not feel* and *think* that all this is of any help to them. Could it possibly be that all this is really not designed or expected to help them?

In this connection some information gleaned from a recent paper by Davidson (8) is of interest. Basing his conclusions on several surveys taken between 1949 and 1954, Davidson stated that: "About half the psychiatrists in the country refuse to sign commitment papers . . . ." He attributed this fact principally to the psychiatrists' fear of possible legal complications and to the assumption that it is more profitable for them to stay in their offices and not to get embroiled in this matter.

[10] The care and treatment of the sick person are entirely incidental in these "public health" measures. This is clear, for example, in the case of leprosy or in that of immigration exclusions on persons with trachoma.

"Occasionally this refusal is due to quirks in local law. More often it is because the call to sign commitment papers interferes with office practice, may give patients an uneasiness about seeing psychiatrists, could embroil the physician in legal red tape, or pull him out at odd hours. On the whole, commitment is a nongratifying, messy, occasionally risky, usually inadequately rewarded activity. It is much pleasanter, safer and more lucrative to remain in the office chair. But this means that commitment is left to physicians less skilled in handling it than psychiatrists. The unsophisticated layman will interpret this as withholding a desperately needed service because it is uncomfortable to the doctor" (8, p. 43).

We should be grateful to Davidson for one of the few comments in the psychiatric literature about commitment which deals with this phenomenon as it is found in society, and not in terms of idealistic moral goals. In interpreting Davidson's data, however, another hypothesis presents itself which might account for, or at least might contribute to the explanation of, the widespread reluctance among psychiatrists to sign commitment papers. Is it not possible that psychiatrists might really *feel* (or, perhaps better, *think* but be unable to admit it to themselves) that there is something fundamentally wrong with the social structure of commitment procedures as they now exist and operate? Although they almost never come out against it openly, this popular passive resistance might well signify a large measure of discontent with it. Here once again an analogy between commitment of the mentally ill and the confinement of certain groups in Nazi concentration camps presents itself. In both cases, large numbers—perhaps even the majority—of the people in whose culture the phenomenon occurred found the practice objectionable and would not willingly lend a helping hand to it. This, however, did not insure that even a few of these would openly object against it. Of course, to do so in Nazi Germany would have been dangerous, perhaps even foolhardy, for the concentration camp was but one manifestation of a social order dedicated to the principles of the "closed society" (20). The analogy, therefore, is merely a suggestion of some similarities and does not imply a close correspondence of these two social phenomena in every detail. To object to commitment procedures is certainly not very dangerous and indeed can not be so as long as our society continues to espouse equalitarianism as one of its fundamental moral principles (11). Yet such objections seem rare and are probably unpopular. The evil of "state hospital conditions" is frequently recognized, but the customary approach to bringing about change lies along the road of suggesting various improvements in the ways and means by which such institutions should operate (e.g., suggestions for increased budgets, better housing, the training and employment of more psychiatrists, and the like). No one can very well object to such suggestions for improvements. They seem to me, however, in some ways like suggestions for the improvement of concentration camps. Everyone would admit that a "humane" concentration camp falls far short as something for which one should strive. Similarly, as long as the fundamental principles of commitment—that is, the conflict between patient and society and the factors that govern the dissipation of this conflict—are not more openly recognized and dealt with, it appears unlikely that any significant improvement in the care of those who would be considered "committable" by current criteria can come into being.

Summary

The aim of this essay was to present a sociopsychiatric examination of commitment procedures. Observations of the actual social (legal) transactions involved in this situation, together with a critical examination of the pertinent psychiatric literature, form the empirical basis of this inquiry.

The generally accepted view of commitment—which regards this as an essentially medical (psychiatric) problem—is presented and critically evaluated. This view is held to be logically inadequate, scientifically misleading and ethically hypocritical. Its chief shortcoming lies in the failure to explicitly differentiate between the manifold social roles and functions of the psychiatrist, some of which might—and usually do—conflict with some others. Among these roles are the psychiatrist as 1) technical expert (scientist), 2) the patient's therapist, 3) an agent and protector of society, 4) educator of the public, and 5) others.

I submit that the most relevant factors pertinent to commitment are inextricably

social and psychological and that they might be approached best by organizing the relevant observations around the question of "Who annoys (or threatens) whom?" In other words, viewing commitment from the point of view of the socio-psychology of games, we regard it as a form of social restraint employed against persons who violate certain rules. An analysis of the social position of the participants who may or may not be committed, and of the nature of the rules which may or may not be violated, is then presented. An historical case (that of King Ludwig II of Bavaria) is cited to document the significance of social role (power) in relation to the legal implications of commitment.

In conclusion, it is emphasized that in the phenomenon of commitment we again encounter the problem of the conflict between patient and society. This conflict seems fundamental to the very fabric of psychiatry, if we use this word to denote the study of "mental health and illness". An attempt is made to throw further light on the problem posed by the commitment of the mentally ill by comparing this process to some other familiar social arrangements, such as: 1) the treatment of patients afflicted with some communicable diseases, 2) the handling of criminals and of the inmates of Nazi concentration camps, and 3) the changing social attitudes toward slavery. If commitment of the mentally ill (and perhaps some other forms of psychiatric "treatment" as well) serves the chief aim of protecting society, then it may not be surprising that the problem of the so-called "major mental diseases" will resist solution along the lines that are currently most enthusiastically pursued. Indeed, the question arises whether "mental disease" (as a social problem) may not be stimulated by the very processes that allegedly combat it, in much the same way as we have witnessed in the case of trying to control the drinking of alcohol by Prohibition.

BIBLIOGRAPHY

1. Alexander, L.: The commitment and suicide of King Ludwig II of Bavaria. *Am. J. Psychiat., 111:* 100–107, 1954.
2. Balint, M.: On punishing offenders. In *Psychoanalysis and Culture.* Wilbur, G. B., and Muensterberger, W., Editors. New York: International Universities Press, 1951, pp. 254–279.
3. Cahn, E.: *The Moral Decision. Right and Wrong in the Light of American Law.* Bloomington, Ind.: Indiana University Press, 1956.
4. Caudill, W.: Applied anthropology in medicine. In *Anthropology Today: An Encyclopedic Inventory.* A. L. Kroeber, Editor. Chicago: The University of Chicago Press, 1953, pp. 771–806.
5. Comment: Unfit parents. *Am. J. Psychiat., 111:* 150–151, 1954.
6. Davidson, H. A.: Commitment papers: Don't let them trip you. *Medical Economics, 33:* 253–266, 1956.
7. Davidson, H. A., *Forensic Psychiatry.* New York: Ronald Press, 1952.
8. Davidson, H. A.: The structure of private practice in psychiatry. *Am. J. Psychiat., 113:* 41–44, 1956.
9. Dennis, N.: *Cards of Identity.* London: Weidenfeld and Nicolson, 1955.
10. Devereux, G.: Charismatic leadership and crisis. In *Psychoanalysis and the Social Sciences,* Vol. 4. New York: International Universities Press, 1955, pp. 145–157.
11. Engle, B., and French, T. M.: Some psychodynamic reflections upon the life and writings of Solon. *Psychoanalyt. Quart., 20:* 253–274, 1951.
12. Group for the Advancement of Psychiatry: Commitment Procedures. Report No. 4. Topeka, Kansas, 1948.
13. Guttmacher, M. S., and Weihofen, H.: *Psychiatry and the Law.* New York: W. W. Norton & Co., 1952.
14. Henderson, D., and Gillespie, R. D.: *A Textbook of Psychiatry,* Ed. 7. London: Oxford University Press, 1952.
15. Kecskemeti, P.: *Meaning, Communication, and Value.* Chicago: The University of Chicago Press, 1952.
16. Linn, L.: *A Handbook of Hospital Psychiatry. A Practical Guide to Therapy.* New York: International Universities Press, 1955.
17. Masserman, J.: *The Practice of Dynamic Psychiatry.* Philadelphia: W. B. Saunders Co., 1955.
18. Noyes, A. P.: *Modern Clinical Psychiatry,* Fourth Edition. Philadelphia: W. B. Saunders Co., 1953.
19. Pinner, M., and Miller, B. F. (Editors): *When Doctors Are Patients.* New York: W. W. Norton & Co., 1952.
20. Popper, K. R.: *The Open Society and Its Enemies.* Princeton, New Jersey: Princeton University Press, 1950.
21. Russell, B.: *Power: A New Social Analysis.* New York: W. W. Norton & Co., 1938.
22. Russell, B.: Satan in the suburbs, or horrors manufactured here. In *Satan in the Suburbs and Other Stories.* New York: Simon and Schuster, 1953, pp. 1–59.
23. Russell, B.: The psychoanalyst's nightmare: Adjustment—a fugue. In *Nightmares of Eminent Persons and Other Stories.* London: The Bodley Head, 1954, pp. 21–30.
24. Savage, G. H.: Chapter XXIV. Legal relationships of the insane. In *Insanity and Allied Neuroses.* London: Cassell and Company, 1898, pp. 483–495.
25. Stanton, A. H., and Schwartz, M. S.: *The Mental Hospital. A Study of Institutional Participation in Psychiatric Illness and Treatment.* New York: Basic Books, 1954.
26. Szasz, T. S.: Malingering: "Diagnosis" or social

condemnation? *Arch. Neurol. & Psychiat., 76:* 432–443, 1956.

27. Szasz, T. S.: Psychiatric expert testimony: Its covert meaning and social function. *Psychiatry* (To be published).
28. Szasz, T. S.: Some observations on the relationship between psychiatry and the law. *Arch. Neurol. & Psychiat., 75:* 297–315, 1956.
29. Szasz, T. S.: Some observations on the use of tranquilizing drugs. *Arch. Neurol. & Psychiat., 77:* 86–92, 1957.
30. Szasz, T. S.: The concept of testamentary capacity. Further observations on the role of psychiatric concepts in legal situations. *J. Nerv. & Ment. Dis.* (To be published.)
31. Wouk, H.: *The Caine Mutiny.* A Novel of World War II. (1951) Garden City, N. Y.: Doubleday & Co., 1954.

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HALLUCINATION: A PROBLEM IN NEUROPHYSIOLOGY[1]

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For an understanding of the physiological mechanism of hallucination, a premise is necessary. When a man, being psychotic or else being asleep and dreaming, hallucinates, for example visually, the content of his vision represents what he is thinking at the moment. The premise is that this content—what he "imagines" he is *seeing*—corresponds to what, if he were not psychotic and not asleep, he would be *thinking*.

What a man thinks at a given moment is his response to time, place and circumstance. A given set of circumstances will cause him to *think* a certain thought, provided he is not psychotic and not asleep. Otherwise they can cause him to *see* or *hear* that thought.

A thirsty man lost in the desert is an example. He thinks incessantly of water. As long as he is in his right mind, he merely *thinks* of it. As his physical state worsens and delirium sets in, he does more than merely *think* of water: he now *sees* pools and fountains, he *hears* the ripple of a brook. In his delirium he hallucinates what previously he had been merely thinking of. Another example is "thought echo" or *Gedankenlautwerden*, in which the hallucination repeats verbatim the thought in the patient's mind.

A schizophrenic man was admitted to a mental hospital in a delusional state. He thought he was going to be electrocuted. He made a social recovery, with good insight. In giving a retrospective account he recalled that one day during his psychosis he was taken to the dentist's office. On entering the office and seeing the chair he thought it was an electric chair and believed his last hour had come. He sat in the chair, and the dental assistant prepared to give him a treatment. When she turned on the current, he thought the moment of electrocution had come, and he saw clouds of white smoke filling the room. Since electrocution is associated with burning flesh, a man about to be executed might *think* of clouds of smoke, provided he is healthy; the schizophrenic *saw* them.

The relationship of hallucinatory content to thought content is not always so clear. It may be obscured by the fact that the thought has been translated into symbolic terms. Insight into this matter may be gained from analysis of your own hypnagogic hallucinations, which often can be related to the thought in your mind at the moment of falling asleep. For example, I had examined a criminal and was contemplating the opinion I would give the court. While falling asleep I pondered the question of determinism and free will. Growing sleepy, I reflected that the question is insoluble. I then saw a wooden chest; it was closed and I knew it was locked and could not be opened because the key was lost. At that moment I woke up and was able to see the relation of the dream image to the thought that had gone before. When awake and capable of mentation on an abstract plane, one can think in terms of an insoluble metaphysical problem. In the reduced state of sleep this abstract concept is translated into its concrete equivalent, a locked wooden chest to which there is no key.

The antecedent thought is sometimes not known but is inferable. Herbert, a college student, used to stay up late to study, and his father would call out that it was time to go to bed. One night, sitting up late, he grew sleepy and heard his father call gruffly from the next room, "Herb! Go to bed!" He got up from his desk and went into the next room where he found his father fast asleep and snoring. We do not know what the student was thinking as he dozed off, but may infer that the image of his father's voice was in the "background of consciousness" if not the forefront.

Vivid Imagery and Faint Imagery

Hughlings Jackson has formulated the neural processes that underlie imagery. He used the terms "vivid image" (as when we *see* an object) and "faint image" (when we merely *think of* it).

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Jackson (2) said (Vol. II, p. 69):

"I suppose that I am seeing a brick. . . . What first happens is that there is a peripheral impression (upon the retina), impulses then pass through the lowest, through the middle, and up to the highest sensory centres. . . . So far we have only stated one half of the reflex action, have only reached the physical condition correlative with the colour of the brick. It and all other objects have shape, and this as much requires to be accounted for as the colour. The shape of an object is the relation of its several positions one to another; our knowledge of this relation is by movements, in this case ocular movements. . . . By currents passing from the highest sensory centres, so to speak, 'across' to the highest motor centres, and from these downwards, through middle and lowest motor centres to muscular periphery, there is development of movements of the eyeballs. . . . Here we have . . . reflex action."

Jackson then considered what happens when we merely think of an object (Vol. II, p. 70):

"The vivid image, the mental state we have (when we see a brick) arises during (not from) the physical condition in the two divisions of the highest centres, and is strongly and definitely 'projected,' because the lower centres are engaged; it *seems* part of the outer world. Next day, we can think of the brick in its absence, have 'an idea of it,' or, as I prefer to say, have a faint image where yesterday we had a vivid image. In this case the reflex action is incomplete and weak; the lowest and the middle sensory centres and the middle and lowest motor are not engaged. The highest sensory and motor centres are alone engaged; there is still reflex action, but only the central links of the great sensorimotor chain are engaged; the central part only of the whole process which occurred in perception is done over again, and, the excitations being slight, the image arising is faint, and, the lower centres not being engaged, it is feebly and indefinitely projected, seems more part of ourselves."

Thus Jackson held that during both vivid and faint imagery there is reflex action. Reflex action characterizes the highest cerebral centers no less than the lowest spinal arcs (3). But this does not concern us here. What does concern us is that a vivid image implicates all levels of the nervous system while a faint image implicates only the highest.

Independence of Levels of the Nervous System

One measure of adaptability is the capacity of nerve centers to act independently of the rest of the nervous system. Centers on the same level may act independently of each other. In piano music there are times when the two hands must play different rhythms simultaneously. The ability to do this is a measure of cerebral evolution. It is undeveloped in children. Infants tend to move the two sides of the body symmetrically.

There is "horizontal independence", where two centers on the same level are concerned. There also is "vertical independence", where lower centers act independently of higher centers, and *vice versa*.

Independence of lower centers. Lower centers function automatically, without the assistance of higher centers, when we walk or drive a car while thinking of something else. The tabetic, whose lower centers are diseased, suffers from their inability to function usefully when given free rein; they require direction from above; he must put his mind on his legs and feet.

Independence of higher centers. The capacity of the highest centers to function alone, that is, the capacity to think without movement and without vivid imagery, is a trait that comes with growth and evolution. The child lacks it; his speech and thought are interwoven. A little girl, when told to think before she speaks, protested, "But how can I know what I think till I hear what I say?" (1). Conversely, the adult who becomes psychotic may regress to the stage where he babbles what he thinks. No more will be said of the motor aspects of this problem as they have been considered elsewhere (4).

Imagination. One of the ingredients of intelligence is imagination, the power to see without the eyes, to see through a brick wall, to picture in advance the consequences of an act, to judge internal event from external sign. Imagination is much misunderstood. Because a small boy plays with a block of wood pretending it is a boat, it is said that children have a "rich imagination", richer than that of

his elders. This romantic notion cannot be right. As regards the complex functions of the highest cerebral centers, growing up means advancement, not a falling behind.

Infantile deficiency in imagination manifests itself in many ways. A three-year-old child has a favorite story which he loves to have read to him. You can read it ten times a day without boring him. He has heard it so often he knows it by heart, word for word. Thus if you omit a single word, or alter a word sequence, he will correct you. Say "black and yellow and white cat" instead of "black and white and yellow cat," and he will call you sharply to task. Why, then, since he knows the story by heart, does he want to hear it read? It is because *hearing* it helps him to *think* it. His powers of imagination are immature, and it is hard for him to think without "help from below". His highest cerebral centers are like a speaker who does well when he has his notes to support him, but falters without them.

This phenomenon and hallucination are two different things, of course, but they have something in common. They both show, each in its own way, that 1) under some conditions (immaturity, disease) the highest cerebral centers have difficulty acting independently of lower centers and seem to need their "help" or cooperation, and that 2) this state of affairs manifests itself in a deficiency of imagination, which is the ability to think an idea without seeing or hearing it.

The psychotic patient suffers from a deficiency rather than a surplus of imagination. Because he hears "imaginary" voices, it would be a mistake to suppose he has a surplus, as much a mistake as to say that children have a "rich imagination".

The concept of the mass reflex is valid for the processes that accompany mentation no less than for the spinal cord. The schizophrenic mentioned above *saw* clouds of smoke in circumstances that normally would cause one merely to *think* of them. A stimulus that normally would evoke a *faint* image (whose substrate lies entirely within the highest cerebral centers) may under some conditions evoke a *vivid* image (whose substrate extends over all levels of the nervous system).

Reconstruction or Flashback Dreams

In these dreams the external stimulus that wakes the sleeper has evoked a long and involved dream that seemingly antecedes the stimulus. In a celebrated example, the Frenchman Maury dreamed he was involved in the French Revolution; he was arrested, tried and sentenced to the guillotine; he was marched in public to the scene of execution, where he climbed the stairs to the platform; his head was laid on the block and he felt the impact of the knife on his neck, at precisely which moment he was wakened by plaster that had fallen from the ceiling, striking him at exactly the same spot on the neck.

This type of dream has caused much wonder. Since the stimulus has evoked the dream, how can the dream antecede and anticipate the stimulus? I submit that this question is not puzzling at all if one bears in mind the physiology of hallucination.

A stimulus may cause one to think of events of the past. A detective walking in the woods comes upon the body of a man with a crushed skull; there are footprints, a blunt instrument and an empty wallet nearby. Seeing these signs of a crime, he pictures a succession of events that will explain what he now sees. He "reconstructs" the crime. In movie language a "flashback" occurs. He has a succession of images—faint images rather than vivid, for he does not see the events but only visualizes them. If he were delirious, he might have the corresponding vivid images; he would report that he *saw* the crime.

Suppose Maury had been wide awake when the plaster struck him. He might have responded with a set of fancies, involving the guillotine, the French Revolution, etc. He might have *pictured* a train of events leading to the guillotine. Since he was asleep, he *hallucinated* them.

There remains the problem of the illusion of antecedence: the dream images seen to antecede the stimulus. This is no more puzzling than the fact that people have flashbacks when awake. We are always thinking of past events in relation to what we see and hear and think of now. Someone says something, or we see a headline, and it calls to mind an image

from the past. This goes on all the time and excites no wonder at all.

To restate the problem of antecedence: since the vivid images of the dream are evoked *simultaneously*, being all evoked in a flash by the stimulus, why do they seem to be experienced *serially*? The answer is that vivid images (with irrelevant exceptions) can be experienced in no other way. In this respect vivid and faint images differ. A series of faint images may be experienced simultaneously even though they belong in sequence; in other words, events falling into a sequence may, by a stretch of the imagination, be imagined simultaneously. Mozart provides an example. He used to compose entirely in his mind and did not write a composition down until he had thought it out completely. Referring to his mental grasp of the composition, he said, "Nor do I hear in my imagination the parts (of the composition) *successively*, but I hear them, as it were, all together" (5). Obviously this is possible with faint images but not with vivid. One may think of two colors simultaneously, but one cannot *see* two colors in the same space at the same moment. To take an example in the motor sphere, the steps of a dance may be imagined simultaneously, but they could not possibly be executed any other way than consecutively.

The importance of reconstruction dreams, from a practical standpoint, is nil, but from a theoretical standpoint it is incalculable, for they throw light on the operation of the thinking apparatus.

BIBLIOGRAPHY

1. Brain, W. Russell: Speech and thought. In *The Physical Basis of Mind*. Symposium edited by Peter Laslett. Oxford: Basil Blackwell, 1950.
2. Jackson, J. Hughlings: *Selected Writings of John Hughlings Jackson*. London: Hodder & Stoughton, 1931–32.
3. Levin, M.: Reflex action in the highest cerebral centers: A tribute to Hughlings Jackson. *J. Nerv. & Ment. Dis. 118:* 481, 1953.
4. Levin M.: Motor hallucination: Some motor aspects of mentation. *Am. J. Psychiat.* 113: 1020, 1957.
5. Terry, C. S. editor: Forkel's Life of Johann Sebastian Bach. New York: Harcourt Brace and Howe 1920 p. 97.

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THE EFFECT OF GROUP ADMINISTRATION UPON SYMPTOM FORMATION UNDER LSD[1]

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During the past few years the number of research studies designed to measure the effect of various drugs upon human behavior has shown a rapid increase. One of the most interesting of these drugs is lysergic acid diethylamide (LSD), largely because of the similarity of its effects to psychosis. Its discovery aroused hopes that the biochemical correlates of psychosis might be more clearly delineated. It also raised the possibility that controlled studies of experimentally induced as well as natural variations in the reactions of individuals to the drug might contribute to our knowledge of the etiology and treatment of psychosis, much as experiments with animals have contributed to our knowledge of the human organism.

Studies of the effects of LSD have been carried out in large part without regard for certain situational variables capable of influencing the course of the reaction. Some studies, for example, have involved the administration of the drug to individual subjects (1), others to groups of subjects (2). The possible effect of this difference has not been considered, yet if the subject's perception of the situation is capable of influencing his reaction to the drug, this would seem to be a serious oversight. The individual who takes a drug alone may view the entire experimental situation in a manner quite different from the individual who takes it along with a group of fellow subjects.

The decision to undertake the present study arose from clinical observation of just such an effect during the routine administration of LSD to research subjects. We were impressed by the tendency for group membership to produce a modification of symptoms in the direction of increased elation and overactivity, and there were a number of striking examples of this tendency. In one group of three students, one of the subjects expressed the view that the entire experiment was like a party and behaved accordingly. Whenever this subject was present, his cosubjects, previously withdrawn and retarded, became more talkative, active and interested, and laughed and joked along with him, relapsing into their original syndromes as soon as he had departed.

Our major interest, however, was not in the temporary contagion of manic-type symptoms, but in the possibility that group membership during the lysergic experiment might produce more permanent differences in symptom formation. In other words, we were interested in testing the hypothesis that subjects taking the drug in groups would manifest symptoms which differed, even when the subjects were separated, from those of subjects taking the drug alone.

PROCEDURE

The sample consisted of 72 normal subjects, mostly college students and hospital personnel. Of these, 24 subjects received LSD[2] alone and 48 in groups of two or more. The experiments were conducted over a two-year period, with exactly half of both the "alone" and "group" subjects taking the drug during each year. The subjects typically had little or no acquaintance prior to the experiment, and no choice as to whether they would take the drug alone or with others.

All subjects received the drug early in the morning and spent the day within the hospital under continued observation. A portion of the day was spent in structured testing and interviewing situations, while during the remainder the subjects were allowed to move about the hospital interacting with patients and personnel. Subjects taking the drug in groups were separated during most of the more structured situations, but were together

[1] This study was carried out as part of a larger Project investigating the effects of lysergic acid. The project was conducted at the Massachusetts Mental Health Center under the direction of Dr. Robert W. Hyde. The authors are indebted to Dr. H. Jackson DeShon, who conducted the clinical psychiatric interviews and made the ratings upon which much of this analysis was based.

[2] One gamma per kilogram of body weight.

when the drug was administered and during unstructured portions of the day.

From three to four hours after administration, which is the period during which the reaction to LSD usually reaches its peak, all subjects were interviewed by a psychiatrist, who rated each on the incidence and intensity of various symptoms, made a diagnostic classification of the nature of the reaction in terms of standard clinical categories, and rated the over-all severity of the reaction on a 6-point scale. The psychiatrist conducted the interview according to the procedure used in interviewing patients upon admission to the hospital. In most cases he had no previous acquaintance with the subject and in all cases had no knowledge of the subject's experiences or reactions during the early part of the day. All subjects were interviewed alone.

The symptom ratings made by the psychiatrist were simplified somewhat for the purposes of this study. Originally, subjects were assigned a zero rating if a given symptom was absent, and a rating of from one to four, according to its intensity, if it was present. To investigate the differences between "alone" and "group" subjects, however, subjects were merely compared with regard to the frequency with which a given symptom was present or absent, and also with respect to the frequency with which it was present in a severe form. "Severe form" was defined as a rating of two, three or four.

Symptoms which were somewhat rare were grouped into broader categories whenever such grouping seemed conceptually sound. In such cases, the ***number*** of symptoms in the broader category exhibited by the subject was tabulated. The significance of all the differences was tested by means of chi-square tests, using the Yates correction (more out of a diffuse conservatism than because such a correction is necessary in a sample of this size). In cases where symptoms were grouped into categories, the mean of the entire sample was used as a cutting-point for the chi-square tests.

In addition to the psychiatrist's ratings, symptom and severity ratings were also made by psychologists and sociologists on the basis of observations of the subject in unstructured situations throughout the day. These ratings will not be described in detail here, but at all comparable points they show the same similarities and differences between "alone" and "group" subjects as do the psychiatrist's ratings.

Sixteen categories of symptoms and the severity ratings were used to test the hypotheses. These categories include, either separately or under broader groupings, all of the ratings made by the psychiatrist except a few symptoms of very rare occurrence which could not be grouped.

There are three broader categories subsuming groups of symptoms. The first, "sensory illusions and hallucinations", includes distortions of size, shape, color, distance, movement, taste, sound. It excludes, however, all forms of distortion of one's own body image. The second, "thinking and speech disturbances", includes difficulties in formulation and expression of ideas, acceleration and retardation of speech and thought, bizarre ideation, and the like. The third, "somatic symptoms", includes a great variety of different physiological manifestations, only a few of which (tremor, numbness, tingling, loss of appetite) occurred with any frequency.

Results

Symptoms

Table 1 shows the proportion of "alone" and "group" subjects showing various symptoms, and also the proportion showing these symptoms in a severe form. The most striking finding is the sharp reduction in anxiety brought about by group membership. Group subjects are also less depressed, have fewer perceptual distortions of a severe nature, fewer thinking and speech disturbances, fewer somatic symptoms, less inappropriate behavior, and are less often severely underactive than the "alone" subjects. They also show some tendency toward less perplexity and confusion although this difference is not significant at the .05 level. On the other hand, the group subjects are more often severely elated and show a tendency, though not significant, toward greater suspiciousness, hostility, and overactivity. The two groups of subjects are virtually identical in the frequency of feelings of unreality, disturbance of body

TABLE 1.—Proportion of "Alone" and "Group" Subjects Manifesting Given Symptoms

Symptom	Proportion Showing Symptom			Proportion Showing Symptom in Severe Form		
	Alone	Group	p*	Alone	Group	p*
Anxiety	.79	.31	.001	.38	.12	.05
Perplexity, confusion	.50	.27	.10	.38	.15	.10
Depression	.38	.12	.05	.08	.04	—
Elation, euphoria	.33	.54	—	.08	.38	.02
Suspiciousness, hostility	.12	.35	.10	.04	.17	—
Indifference	.62	.50	—	.50	.35	—
Feelings of unreality	.79	.81	—	.67	.65	—
Disturbance of body image	.38	.40	—	.29	.21	—
Sensory illusion, hallucination	2.54†	1.69	—	1.75	.79	.05
Thinking and speech disturbance	3.58†	2.62	.001	2.00	1.35	—
Somatic symptoms	5.38†	3.96	.01	2.21	1.54	—
Underactivity	.67	.42	.10	.29	.04	.01
Overactivity	.21	.40	—	.08	.19	—
Inappropriate behavior	.58	.21	.01	.12	.15	—
Inability to carry out	.92	.94	—	.79	.62	—
Attention impairment	.50	.46	—	.08	.15	—

* Using chi-square test with Yates correction.

† Mean number of separate symptoms in this category per man. The mean of the total sample was used as the cutting-point.

TABLE 2.—Psychiatrist's Diagnosis of Reactions of "Alone" and "Group" Subjects (by Percentage)

Diagnosis	Alone Subjects	Group Subjects
Schizophrenic-turmoil	62.5	29.2
Schizophrenic-undifferentiated	12.5	16.7
Schizophrenic-affective	8.3	16.7
Manic	0.0	18.7
Other	16.7	18.7

image, inability to carry out, attention impairment and indifference.

It might be of interest to consider in more detail the grouped symptom categories in terms of the individual symptoms which show the most striking trends. For sensory illusions, this symptom is distortion of size, and occurs significantly (.02 level) more often among "alone" subjects.

Thinking and speech disturbances do not include any single symptom which significantly differentiates "group" from "alone" subjects, while only one is to be found among the somatic symptoms. The latter is loss of appetite which occurs more frequently (.05 level) among "alone" subjects.

Severity

The psychiatrist's rating of severity was an attempt to estimate the over-all severity of the subject's reaction without regard to type of symptoms or diagnosis. The ratings ranged from "minimal" to "severe" on a 6-point scale. The mean rating for alone subjects was 3.6, while the mean rating for group subjects was 3.4. This difference does not approach significance.

Diagnosis

The differences between alone and group subjects with regard to symptom formation would lead us to expect differences in diagnosis between these two classes of subjects. Only four diagnostic categories appeared with any frequency in the psychiatrist's ratings although a total of twelve were utilized. The four most common diagnoses were, in order of frequency, schizophrenic-turmoil, schizophrenic-undifferentiated, schizophrenic-affective and manic. The symptom differences in table 1 suggest that the first two categories would be applied more often to alone subjects and the latter two to group subjects.

Table 2 shows the percentage of alone and group subjects falling into each of these categories, and supports the above prediction save for the schizophrenic-undifferentiated category, which shows a more or less equal proportion of alone and group subjects. The tendency for alone subjects to fall into the turmoil category and group subjects to fall

into the manic or schizo-affective category is significant at the .01 level, using a chi-square test.

Discussion

There are many possible reasons for these differences between alone and group subjects. In the first place, the "aloneness" of the alone subject may have considerable emotional significance for him. He finds himself in a situation in which he has been made different from everyone else. He experiences strange sensations which no one else is experiencing, and the newness of these sensations is often frightening. The presence of a cosubject with whom the subject can compare symptoms provides reassurance that the subject is not entirely separate from other people. To be different alone is to be crazy or eccentric, but to be different together is merely to be exclusive.

When cosubjects are present, it becomes possible for the subject to redefine the experimental situation with very little subjective discomfort. It may be defined as a social situation, a party, or a game, and, as long as all agree, to define it is to create it. For the isolated subject to attempt to define the situation as a party might in itself create malaise, in view of the obvious unreality of such a redefinition. It would seem merely an indication of the severity of his reaction. The isolated subject's definition of the situation as an experimental task may actually be an important source of support since the only alternative to "experiment" might seem to be actual psychosis.

Despite these subjective benefits derived from group membership in LSD experiments, the over-all severity of the psychotic-like reaction is not mitigated by such membership. Symptoms such as unreality, indifference, disturbance of body image and inability to carry out—symptoms generally (and perhaps for this reason) treated as among the most severe of all the symptom manifestations of psychosis—are not susceptible to casual and unstructured interpersonal influences.

The group effect, then, does not counteract the impact of LSD but merely modifies it. At the same time, this effect seems powerful enough to warrant more careful consideration of the design of future drug experiments since it would be possible to arrive at totally disparate descriptions of the effects of a given drug depending upon whether it was administered to individuals or to groups.

Finally, although it is as yet too early to speculate about the broader substantive implications of these findings, one cannot help wondering whether similar differences might not be found between psychotics on a ward and psychotics kept in isolation. This would seem to be a fruitful ground for further research.

Summary

Subjects receiving LSD in groups were compared with subjects receiving the drug alone and found to have several differences in reaction. Group subjects tended to have manic or schizo-affective reactions, while alone subjects tended to have schizophrenic-turmoil reactions. Alone subjects showed more anxiety, depression, inappropriate behavior, underactivity, sensory illusions and hallucinations, thinking and speech disturbances, and somatic symptoms, while group subjects showed more elation. There were no differences between the two groups with regard to the incidence of feelings of unreality, disturbance of body image, inability to carry out, attention impairment or indifference, nor were there differences in the over-all severity of the reaction.

Bibliography

1. DeShon, H. J., Rinkel, M., and Solomon, H. C.: Mental changes experimentally produced by LSD (d-lysergic acid diethylamide tartrate). *Psychiatric Quart., 26:* 33–53, 1952.
2. Jarvik, M. E., Abramson, H. A., and Hirsch, M. W.: Comparative subjective effects of seven drugs including lysergic acid diethylamide (LSD-25). *J. Abnorm. & Social Psychol., 51:* 657–662, 1955.

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PSYCHOPHARMACOLOGICAL STUDIES ON SUPPRESSION[1]

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I. Introduction

Relatively little has been written in the psychiatric literature about suppression as a psychological process. Most psychiatrists, in fact, think of suppression primarily as a definitional concept in distinction to repression. The latter has understandably received extensive study as a process of critical importance in modern concepts of psychopathology. Although it is less capable of psychodynamic mischief, suppression is nevertheless an important ego function in its own right. All of us consciously inhibit the expression of certain thoughts and feelings. The fact that we can be aware of this inhibition, that it serves the ego so conveniently, and that its motivation appears so obvious to us probably all contribute to our lack of curiosity about suppression.

One becomes more aware of suppression as an ego process when it is directly challenged. This occurs in mild form when the patient is urged by his psychotherapist to talk freely about himself, or when a wife probes for suspected indiscretions in her husband's behavior at a sales managers' convention. The awareness is acute when the guilty suspect is interrogated by the police. The subject then finds that the maintenance of suppression requires vigilance, an expenditure of psychic energy, and usually some defensive maneuvers. Police interrogators are actually more familiar, in a practical way, with the psychodynamics of suppression than most psychiatrists.

This paper reports a pilot series of experiments on the effects of drugs on suppression in "normal volunteer" subjects. Suppression was chosen as an area of study because it is more amenable to experimental techniques than other more complex psychological functions. It can be operationally defined for the purposes of a given experiment, and some of the intervening variables which affect it can be readily controlled.

The development of ego psychology and of theories of personality which emphasize the role of interpersonal processes has brought increasing sophistication to studies of drugs which affect the conscious, adaptive aspects of behavior. It has become increasingly apparent that the response to a particular drug is determined not only by the chemical nature of the drug given but by the subject's personality, cultural background, his previous experiences in general and with drugs in particular, his psychic state at the time the drug is given, the experimental setting and his relationship to the investigator. These factors may condition the drug response whether one is studying an obviously complex process such as repression or psychomotor measurements such as reaction time; their importance in studies of the effects of drugs on suppression is apparent from the limited work which has been previously carried out in this field.

For example, there has been sporadic interest for many years in the possibility of using "truth drugs", particularly scopolamine and barbiturates, for criminal investigation. While the legal and ethical problems involved have limited the use of such methods, the results reported have been generally disappointing (1, 2) The hardened criminal, i.e., one without appreciable anxiety, guilt, or unconscious need for confession, is often relatively uninfluenced. On the other hand, the results with more vulnerable subjects have not been convincingly different from those which can be achieved by skillful interrogation without drugs. The influence of personality and other behavioral determinants is apparent not only in response to drugs but in any situation where deliberate efforts are made to influence behavior. This has been illustrated recently by analysis of the individual differences involved in the capacity of prisoners of war to maintain ego integrity in the face of psychological and physiological stress imposed by their captors.

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The nature and extent of suppression will ordinarily vary with an individual's motivational set under particular circumstances. This "set" is conditioned by the manner in which he identifies the informant, the nature of their relationship, whether confidence will be kept, as well as by the use which might be made of the suppressed information. Things would ordinarily be suppressed which if revealed to certain persons might prove embarrassing, legally incriminating, or in other ways directly harmful to the informer. Other feelings or thoughts might be suppressed for the anticipated discomfort they would produce in the informant and the detrimental effects their expression might have on their relationship. When an individual is under threatening interrogation, his ability to identify clearly the role of his interrogator and to have consistent feelings toward him are particularly necessary for marshalling his suppressive forces. A common interrogation method involves attempts to disrupt this emotional set by alternating "bad" and "good" interrogators—the one threatening and hostile, the other solicitous and friendly.

Under some circumstances, the release of information may be a sufficient ego reward to overcome the usual suppressive forces, e.g., confessions to relieve guilt, or as in the case of prisoners of war, the motivation supporting suppression can be displaced by threats, bribery or other forms of psychological pressure.

II. Purpose

The purpose of the studies to be reported was to determine what influence, if any, different drugs which affect central nervous system function might have upon the capacity of subjects to suppress certain information. The experiments were designed, in so far as was possible, to isolate the effects of the drugs as the experimental variable from other intervening variables which might influence the behavior of the subjects.

It would have been so difficult to recreate experimentally the circumstances under which suppression would ordinarily occur in the various subjects that no apologies will be made for the artificiality of the experimental design employed. The findings reported will of course be valid only for the particular circumstances of these studies.

III. Subjects

Twenty, paid, volunteer male college students over the age of twenty-one participated in the experiments. Their assigned role was to withhold certain information from the investigator despite his use of drugs which would alter their mental state. Because of possible individual differences in drug response, several trials were carried out on different subjects with each drug or drug combination. Their capacity to withhold such information appears to have been motivated in a variety of ways. First, desire for monetary compensation by being an experimental subject and concern that they might not be used again as a subject should their suppression fail. Second, assumptions made by them that the experimental procedure was important and therefore deserving their full cooperation. Third, some of the subjects appeared to take pride in their integrity or "will power" and regarded the experiment as an ego-challenging situation. In fact, this latter source of gratification appears to have been a strong selective factor among those who volunteered for the experiments.

IV. Baseline Evaluation

A medical history and physical examination were carried out on each subject to detect physical conditions which might increase the risks of drug administration. A clinical psychiatric interview was also done in an effort to characterize the personality structure of the subject and to exclude those who might be poor risks from a psychiatric standpoint. Routine psychological testing was done. This consisted of a Rorschach Test, Thematic Apperception Test, and the personality factor test of Cattell. These data were to be subsequently utilized for correlation of personality structure with the character of the drug-induced changes in mental state and the success or failure of suppression in the experimental setting.

V. Methods

The subjects were instructed to suppress from the interviewer during the experimental period the following types of information:

A. Two items of amnestic data unknown to the interviewer (e.g., birthplace, father or mother's name, wife's name, etc.). These were chosen by the subject and recorded on a piece

of paper retained by a technician until the end of the experiment.

B. An "experimental secret" invented by a technician and unknown to the interviewer. The "secrets" were devised to bear resemblance to those which might be involved in military intelligence.

C. The "true story" for which the "cover story" was substituted. This phase of the experiment utilized the cover story technique described by Redlich *et al.* (3). In brief, this technique consists of having the subject record an episode from his life which he regards as particularly humiliating, culpable, guilt-laden, etc. He then devises an "alibi" or "cover story" to substitute for the true incident. The "cover story" while bearing a resemblance to the true story has been changed in such a way as to exonerate the subject by distortion, rationalization, etc. Both stories were written down by the subject, the true version being given to the technician, the cover story to the interrogator.

The amnestic items were drawn from the pool of commonplace, personal information which the subject would not ordinarily suppress. The "experimental secret" represented an artificial, recently memorized bit of information which could not be presumed to be of much importance to the subject except for its fanciful resemblance to a military secret. To contrast with these rather neutral areas, the "cover story" technique was used because the material suppressed might be sufficiently affect-laden to be of real ego concern to the subject.

The subjects were studied individually in sessions which were of 4 to 8 hours' duration, depending upon the quantity of drugs given. The experimental setting was identical on all occasions. The interviewer administered the drugs. To avoid frequent vein-puncture, the intravenous drugs were injected into the tubing of an intravenous set through which was given a slow infusion of normal saline or 5 per cent dextrose and water. The subjects were not aware of the nature of the drugs given nor, on some occasions, when the drug had been administered. Observations on the behavior of the subject and interviewer were made at 5 to 10-minute intervals by a technician looking through a one-way vision mirror. Continuous tape recordings from a concealed microphone were made of all communications between the subject and interviewer, as well as of spontaneous verbal productions of the subject.

The interviewer remained in the role of the physician-investigator. Persistent but friendly efforts were made to elicit the suppressed information. The subject was asked to repeat the "cover" story at intervals during control and drug periods, and deviations from the original phraseology and content of the story were noted. The questioning was done in a standardized manner. Trick questions, threats, or cross-examination methods were not used.

At the end of each experiment the subject was asked to reveal the suppressed material, and the content was checked with the original version held by the technician. This was done to exclude the possibility that failure to communicate had been secondary to forgetting. Information was defined as suppressed if it was not revealed upon specific inquiry during the experimental situation but could be communicated under other circumstances.

VI. Drugs Administered

A variety of hypnotic, narcotic, analeptic, and hallucinogenic drugs was used. Each drug was studied alone and in combination with other drugs. Most of them were given intravenously to produce greater rapidity of action. The larger amounts of drugs were given in divided doses. The subjects were under constant observation, and when large doses of narcotic or hypnotic drugs were given, an anesthetist was on hand with equipment for resuscitation and oxygen administration. It will be evident from the experiments outlined below that some of the drugs were given in excessively high dosages and that some of the drug combinations had no rational justification. Actually, they were given on a purely empirical basis with the objective of producing maximum disruptive effects upon ego integration and alteration in awareness. However, in terms of the objectives of the study, it was not feasible to induce such severe impairment that the subjects could no longer communicate or respond to questions.

A. Eight experiments were carried out on the effects of intravenous thiopental in doses of 0.5 to 1.0 gm. On three occasions the subjects were pre-medicated with atropine (0.4 mg.)

and the rate of injection increased until loss of consciousness occurred. The subjects were interrogated before and at all stages of recovery from the state of general anesthesia thus induced. In seven of these experiments the thiopental-intoxicated subjects were studied after intravenous administration of 20 mg. amphetamine (5 experiments) or 10 mg. methamphetamine (2 experiments).

B. Two subjects were given intravenous sodium amobarbital in doses of 0.5 and 0.7 gm. This was followed by 20 mg. amphetamine intravenously on both occasions.

C. Three subjects were given 100 to 120 cc. 95 per cent ethyl alcohol (intravenously in 5 per cent solution with dextrose and water). A state of severe alcoholic intoxication was induced by rapid administration. In addition, one subject was given 0.2 gm. thiopental intravenously while intoxicated and another 20 mg. amphetamine intravenously.

D. Five subjects were given scopolamine hydrobromide intravenously in doses from 0.3 to 0.6 mg. During scopolamine intoxication the effects of 0.25 gm. pentobarbital sodium intravenously (1 experiment), 0.5 gm. thiopental intravenously followed by 10 mg. methamphetamine intravenously (1 experiment), and 0.6 and 0.4 gm. thiopental (2 experiments) were also studied.

E. In two experiments, morphine and scopolamine were given intravenously at the same time. The doses were 30 mg. morphine with 0.3 mg. scopolamine and 19 mg. morphine with 0.7 mg. scopolamine. During the morphine-scopolamine intoxication one subject was given 60 mg. pentobarbital and the other 10 mg. amphetamine sulfate.

F. The effects of divided doses of intravenous morphine in total quantity varying from 28 to 48 mg. were studied in four experiments. Five mg. amphetamine intravenously (1 experiment), 20 mg. amphetamine intravenously (1 experiment), 20 mg. amphetamine and 0.4 mg. atropine intravenously (1 experiment) and 0.5 gm. caffeine sodium benzoate intramuscularly (1 experiment) were later given to the morphine-intoxicated subjects.

G. The effects of 60 mg. of amphetamine intravenously in divided dosages were studied in one subject. He was then given 0.5 gm. thiopental intravenously while under stimulation with this large amount of amphetamine.

H. Five experiments were concerned with the effects of 0.2 to 0.6 gm. mescaline sulfate p.o. The effects of the addition of 10 mg. amphetamine i.v. (1 experiment), 0.4 gm. sodium amobarbital i.v. (1 experiment), 0.4 gm. thiopental i.v. (1 experiment) and 0.4 mg. scopolamine hydrobromide i.v. (1 experiment) to the mescaline-intoxicated subject were also studied.

VII. Results

The drugs and combinations of drugs used in these experiments were given in such large amounts that they produced grossly abnormal states of mind. At various times, subjects became semicomatose, mildly delirious, panicky, markedly loquacious, euphoric, or underwent transient dissociative reactions; yet, curiously, at no time was there sufficient ego impairment that they were unable to identify the significance of questions about the suppressed information and avoid answering them in response to direct questioning. As long as they remained in auditory contact with the interrogator, they consistently refused to reveal the suppressed items.

The "experimental secret" was not given up by any of the subjects. Similarly, none of them revealed the suppressed items of amnestic data in response to specific questioning. However, on two occasions the names of close relatives being used as suppressed information were revealed, apparently as slips of the tongue, in the course of spontaneous, dissociative ramblings while severely intoxicated with scopolamine and thiopental in combination.

The findings with the "cover story" technique were essentially those of Redlich *et al.* Under thiopental narcosis, two subjects produced significant variations in the cover story which betrayed the content of the true story. These individuals were of a more neurotic character pattern than the other subjects, and their true stories centered on problems of unresolved guilt. However, the remaining subjects, if they were able to talk at all coherently, reproduced the cover stories with remarkable fidelity to the original version.

Some observations on the general psychological effects of these drugs deserve mention.

A. More success was achieved with thiopental than with amobarbital in maintaining a prolonged "Stage II" narcosis. The prompt action and usually rapid elimination of the former drug make possible more precise control of the degree of intoxication.

The experience with intravenous barbiturates essentially confirms previous work with these drugs, in that they produce mild euphoria, increased warmth in affective ties with others, talkativeness, and in some cases, increased emotional expression. However, despite their known depressant effect on cortical activity, these drugs did not grossly impair intellectual functions such as memory, judgment, and control of associative processes as they were tested in the experimental situation. A definite abreaction occurred in only one subject.

B. The barbiturate drowsiness was in all cases promptly reversed by amphetamine, producing an alert, loquacious, euphoric subject. However, the dizziness and motor incoordination secondary to the barbiturate did not appear significantly affected by amphetamine. Methamphetamine was as effective as amphetamine as an analeptic under these circumstances but appeared to produce more motor restlessness and loquacity than amphetamine.

C. Intravenous alcohol produced a lesser degree of euphoria and talkativeness than the barbiturates and in the doses given produced no noticeable effects upon the intellectual functions under investigation. Pentobarbital or thiopental when added to the alcohol intoxication produced nothing more than an increase in drowsiness.

D. In mild intoxication with intravenous scopolamine, there occurred drowsiness, slight euphoria, and undertalkativeness. With larger dosage there was overwhelming drowsiness, motor restlessness, severe impairment of recent memory, inability to maintain sequential thought, incoherence of speech, and vivid, hypnagogic phantasies (verging on hallucinations). The clinical picture resembled a mild toxic delirium. The subjects talked aloud to imaginary individuals and suffered momentary loss of orientation. Ability to reproduce the cover story was impaired because of the recent memory deficit and the intrusion of irrelevant associations. However, the subjects were able to maintain the essential points of the cover story as a screen for the true story.

There were two other features of the scopolamine experiments which were of some interest. First, amphetamine had little analeptic effect on scopolamine drowsiness in contrast to its dramatic effect when given after barbiturates. Secondly, scopolamine, when given before thiopental, seemed to decrease or eliminate the euphoria and loquaciousness usually evident in the excitement stage of barbiturate intoxication.

E. Amphetamine and metamphetamine while producing considerable talkativeness did not impair the ability of the subjects to avoid revealing the suppressed information. Despite their high verbal productivity, they retained good control of the content communicated.

F. Morphine produced drowsiness, underactivity, and occasionally agreeable reveries but no loss of ego control as far as suppression was concerned. The results were essentially the same when morphine and scopolamine were given together. A transient panic reaction occurred in one subject when given amphetamine during morphine narcosis. The amphetamine appears to have produced in him an impulse to act out erotic phantasies he had been comfortably enjoying under morphine so long as such executive drives were in abeyance.

VIII. Summary

A. A brief discussion has been given of suppression as an ego function, and its advantages as a process for experimental investigation have been emphasized.

B. An experimental design for studying the effects of drugs on capacity for suppression in "normal volunteer" subjects has been described.

C. The effects on three types of suppressed information of large amounts of hypnotic, narcotic, analeptic, and hallucinogenic drugs, given alone and in combination, have been reported. The drugs were given empirically to produce maximum disruptive effects on ego function and alteration in awareness.

D. With the exception of two instances of

"slips of the tongue" which have been mentioned, the subjects demonstrated, under the experimental conditions described, impressive ego integrity in so far as maintenance of suppression was concerned. Despite grossly abnormal mental states induced by the drugs, they vigilantly guarded the suppressed information. Suppression as an ego function appears to be quite resistant to the forms of drug intoxication used.

BIBLIOGRAPHY

1. Inbau, F. G.: *Self-Incrimination.* Springfield, Ill.: C. C. Thomas, 1950, p. 69.
2. McDonald, M. D.: Narcoanalysis and criminal law. *Am. J. Psychiat., 111:* 283–288, 1954.
3. Redlich, F. C., Ravitz, L. J., Jr., and Dession, G. H.: Narcoanalysis and truth. *Am. J. Psychiat., 107:* 586–593, 1951.

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THE EFFECT OF DIVERGENT VIEWPOINTS IN ANALYTICAL PSYCHOTHERAPY TRAINING[1]

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Training in analytical psychotherapy and psychoanalysis since their inception has been handicapped by the fact that most training centers require their instructors to adhere to one theoretical system and frame of reference.

The existence of so many differing dogmas and viewpoints concerning theories of psychodynamics and psychopathology which are taught as scientific truths indicates that probably no single one has all the answers. The acceptance of just one theoretical approach in most training schools and the exclusion of all others is a block to open investigation and the development of broad scientific interests on the part of its students. Alexander (2) recently emphasized this aspect when writing about analytical training; "... the insistence upon uniformity is a lethal enemy of all scientific progress, which lives on differences in ideas and conceptions ... science must not only tolerate but encourage criticism and diversity of ideas."

Balint (3) in his frank and thought provoking discussion of analytical training brought out the similarity between psychoanalytical training and initiation rites with the resultant identification of the neophyte with his initiator, as he submits "to dogmatic and authoritative treatment without protest."

The many schisms in the field of analysis—which have almost all centered on who may teach what—have seriously interfered with progress in the field. Some schools of thought minimize the findings of those of other schools while at the same time claiming that the significant contributions of these others are incorporated into their own system.

Kubie (7) states: "Consequently (the risk of becoming too tradition-bound in theory and technique) the organization which was formed to preserve standards led to the splitting off of some rebellious groups, amid accusations that the Training Commission was stifling free scientific thought... In the main, whatever was valid in these rebellions was absorbed into the theories and techniques of the parent group."

Such a seemingly open point of view is often propounded, but it is questionable whether it works out well in practice. The authoritarian system that utilizes such an approach is not usually open to scientific methodology and freedom of inquiry. More often the result is that the essential body of theory and technique of the group become inviolate, its elders being unable to tolerate any contribution that is not consistent with its basic dogma. There comes to my mind an analogy to Joan of Arc whose heresy was that God's heavenly representatives could not have talked with her directly but that only the organized Church could speak for God. Thus, the perpetuation of the Church itself was the paramount consideration. The Church, 25 years after her death, reversed the decision of Joan's guilt and 400 years later canonized her. Today some scientists talk of the excommunication of those who differ, and of the valid ideas in these "rebellions" later being absorbed into the "parent" group. True, the rebellions centered around strong personalities, but who else would dare to challenge the theories of the "parent" body? How much more might we have gained by now if the scientific atmosphere of our psychoanalytic societies had been such as to allow these personalities to teach and work together.

A few notable exceptions fortunately do exist (5), but the effects of their approach have not yet been reported. The emergence this year of a new national psychoanalytic society that welcomes graduates of all psychoanalytic training schools is a notable step in the direction of increased scientific freedom and exchange.

At the Postgraduate Center for Psychotherapy, we have sought to demonstrate that it is possible for psychoanalysts and therapists

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of various schools of thought to work together. They work cooperatively from faculty and administrative level to student level. Many problems do, of course, arise and will continue to develop. Some of these problems have been worked out, others will have to be coped with for some time. The staff is united in the conviction that therapists in a training, research and service center should have the professional integrity and maturity to be able to work together. Problems that cannot be resolved can be controlled by an adult give and take, so that destructive actions by groups or individuals are kept to a minimum.

The faculty and supervisors are drawn from most of the major psychoanalytic schools of thought. Unfortunately, in the past few years we have lost some excellent instructors and supervisors because their "parent" analytic society has forbidden them to teach except in training centers under the aegis of the "parent" group. We have missed these colleagues, but believe that they and their society have lost too by not being able to work cooperatively with others of differing theoretical points of view. Others with the same orientation, however, are represented on our staff.

Our ability to function effectively is based on the maintenance of academic freedom in an atmosphere of open discussion and free expression of differing theoretical and technical viewpoints. A continuous effort is made to keep such discussions centered on facts, not personalities, and to respect each others integrity and sincerity. It behooves us to be humble because our knowledge is still fragmentary and our technical tools relatively undeveloped in relation to the vast problems that confront us therapeutically and prophylacticly.

Program

Training consists of personal psychoanalysis, extensive clinical work under supervision, didatic courses and clinical seminars, and participation in a community and a research project. The Center's criteria for considering and accepting trainees have been described elsewhere, as have also details of the training program (1, 9, 10). I shall deal here only with some questions relevant to the utilization of different schools of thought in our curriculum.

There are certain basic concepts that are common to our faculty. We accept the validity of the concept of unconscious forces, the operation of mechanisms of defense, and the effects of resistance and transference as potent forces in the therapeutic process, and the need to employ techniques of dream interpretation, free association and the analysis of transference and resistance as important tools in broadening the patient's areas of awareness and of developing his insight as a vehicle of significant personality change.

The new student, who has already started his personal analysis with an analyst of any theoretical orientation of his own choice, is immediately exposed to differing points of view in classes and seminars. At first he has only one supervisor assigned without regard to whether the supervisor's orientation is or is not similar to that of the trainee's analyst. During the course of his training the student will have at least four (the average is five) supervisors. Care is taken to see to it that his supervisors have been representative of at least two or three important points of view. Training takes a minimum of three years but usually lasts four or five years.

Experience has demonstrated that if faculty members are to be effective, they should teach what they themselves believe, albeit without pressing their point of view dogmatically and with allowing the expression of differing points of view. The dogmatic, authoritarian instructor has found subsequently that he creates much hostility in his class, as evidenced by a lack of spontaneity and liveliness in discussion or by constant challenging of his ideas.

Instructors of the first year classes, especially in the clinical conferences, are particularly flexible in their own approaches and sensitive to the problems and needs of the students. Like the individual supervisor they help to bridge the gap between the differing viewpoints and techniques to which the beginning therapist is exposed. The students, for their part, try to learn from what each particular instructor has to offer.

In addition to teaching technical handling and uniting theory and practice, supervisors concentrate on helping the trainee to comprehend the latent content of the patient's productions. They work towards the development

of the trainee's sensitivity to and understanding of his patients, and strive to give him technical tools with which to convert his understanding into therapeutic skills. Students are encouraged to broaden their horizons so that they may be freer to think originally and creatively. They are urged to hypothesize and to test. To do this and to pass on to the student the heritage and accumulated knowledge of the field is indeed a difficult task.

Effect on Trainees

Naturally, some students are confused by the various theoretical and technical views to which they are exposed. Their supervisors are prepared to meet this situation by helping to guide the trainee through the hazards of early therapy, until he gradually gains the knowledge and experience to develop and test his own theoretical convictions and techniques.

Most trainees are reasonably mature and find this system to their liking. Those who tend to be confused and overly anxious usually have personality problems that are reflected in other areas. For instance, they may be inclined towards characterologic rigidity (4) and obsessiveness. Some temporarily solve their dilemma by identifying and taking over what they believe to be their own analyst's orientation or that of one particular supervisor. They may follow through on a set orientation to which they have already married themselves prior to coming to the Center for further training. Partly due to a desire to be approved by their supervisors and the committee that finally passes on their clinical work, and partly because of dependency, some prematurely adopt a particular, well-established orientation of one of the standardized schools. Occasionally, a student may do this as a reaction to the Center's approach, feeling that he is more comfortable with one particular point of view. Such students usually change and loosen in their attitudes as they become more secure. For a time they may be unaware of how they have integrated theoretical and technical ideas from the various schools of thought to which they had been exposed. But eventually they can more readily appreciate what they have absorbed from various sources.

We have observed that many trainees tend to be uneasy during the first year. They feel themselves to be on uncertain ground, complaining that they have no detailed plan supplied to them that they may follow. Some are blissfully cocky, unaware, at first, of their inadequacies.

By the second year students have usually accepted the fact that there are few final answers in this field, and that our frontiers of knowledge are fluid and ever expanding. They become cautious about accepting complete systems that explain all, and are learning to test hypotheses and theories against their own clinical observations. By the third year they have begun to integrate what they have been taught with their own experience and have begun to arrive at their own theoretical and technical approach. Some take much longer to begin the process of integration, which once begun continues indefinitely.

The problem of conflicting ideologies, at least on a reality level, is eased for the student because there is no insistence on his adopting the supervisor's philosophy and methodology. Gradually the student finds a method of working and thinking with which he is most at ease.

Working in this milieu, the student learns to consider and to respect the views of others. He cannot live together for several years with his classmates and colleagues without being affected by their ideas and contributions. He ends up finding much less need to be protectively dogmatic and defensive than when he had begun training.

Although we know our graduates to be quite flexible doctrinaire-wise, most do develop a noticeable tendency (rather than strict adherence) to one or another point of view. Factors of personality appear to be influential in the choice of the therapist's major orientation. The determination of theoretical bias is influenced somewhat by his own analyst (the choice of whom was often based on already set notions or personality needs) and his supervisors. However, the more rigid personality tends to drift towards a theoretical orientation that offers him a more structured framework. At the other end of the spectrum is the rare individual who finds it difficult to accept any authority and who tends to go overboard on a supposed eclectic or totally original approach, accepting no allegiance or offering no gratefulness to any predecessor or peer. Some, continuing to have

difficulty with their own emotional spontaneity or finding it hard to accept their patients' emotions, will drift towards theoretical and technical positions with which they feel more comfortable. Those who are disillusioned and bitter about the seemingly hopeless messes mankind gets itself into may drift towards an existentialist philosophical point of view that leads to still another therapeutic orientation. And so it goes. Until we can arrive at a greater understanding of the laws of human behavior and psychopathology, personality factors rather than science will continue to overdetermine the choice of theoretical position.

It is because of these emotional and characterological factors in the selection of theory and technique that many analysts tend to become so upset at their ultimate recognition that they are defending a hypothesis, not a scientifically proven fact.

Interestingly enough, we have observed that theoretical differences between student and supervisor do not make for serious interference with the learning process. The supervisor's personality appears to be much more important in this matter than his particular orientation. The supervisor who knows how to work in a mature understanding way is able to teach more effectively than one who arouses defensiveness and hostility. This was nicely demonstrated in a recent supervisors study group (4) when one supervisor submitted a case of his own for supervision to a group of his peers. He then noted his emotional reactions to each supervisor and what he had learned from the comments of each. One supervisor mobilized his anxiety which led him to be defensive. The comments of two others he "forgot." The supervisors he liked and appreciated were most helpful to him. Analysis of his reactions revealed that he was prepared to learn from those who did not threaten him, who understood his anxiety and appreciated the efforts he was making with the patient.

A student may attempt to play one supervisor off against another or against his own analyst. He may collect opinions on a particular problem or case and then burst out with: "One says this, one says that. What in the world am I supposed to do?" The faculty is alert to this type of problem and has learned to cope with it by not reacting competitively with other faculty members but by working with the essential material the therapist presents.

In some cases the problem of playing supervisors off against one another has produced misunderstandings between supervisors. When this occurs, the causative factor has usually been other than the different theoretical or technical viewpoints involved.

For example, a determining factor has often been some psychological need of the student. On a rare occasion the student's dilemma has been reality-based, due to the actions or attitudes of one or another of his supervisors. Most situations of this kind are readily worked out by the supervisors' conferring with one another. Occasionally they have requested the department head to discuss the problem with them and have been able to arrive at a satisfactory conclusion with mutual gaining of insight.

In meetings and in other spheres of the Center we concentrate on maintaining and expanding our means of communication. We have found that the best means of getting down to brass tacks is to discuss case material. It is in terms of case material that we best bring forth our ideas so that they become comprehensible to others. Similarities and differences in thinking and techniques then become readily apparent. Improved communication, as we so well know in our field, is the only means by which we can work towards a common understanding and frustrate destructive personal reactions.

Students are encouraged and urged to try the different approaches to which they are exposed. The acceptance of differences makes it relatively easy for our students and graduates to express their own ideas and observations. This encourages excellent professional productivity in contradistinction to the inhibition of scientific productivity of the younger members of some psychoanalytic groups, such as was recently described by Martin (8). Martin credited his younger colleagues difficulties to an unresolved castration threat. For some this is possibly true; for others the inhibition may be connected with realistic "castration" threats in the professional setting in which they aspire to be accepted.

Effect on Supervisors and Faculty

The supervisors, who compose the major part of the faculty, meet at weekly conferences to discuss problems of supervision, training and administration. Over a period of eight years this group has worked out a common understanding and language. Disagreements still exist, of course, and probably will for the foreseeable future. Most differences are discussed quite openly and freely and do not slowly smolder only to burst out into sudden explosion.

At first members of the supervisory group were reluctant to expose themselves to their peers. The ice was broken by the head of the department presenting for discussion a case of his own. Since that time many methods of exploration of our problems have been employed. They have included presentations by various supervisors of cases of their own for the group to "supervise". This has had the two fold effect of bringing to light our specific ideas about therapy as well as our methods of supervision. At other times a student or staff member has presented to the group and then left the room while each supervisor discussed how and why he would supervise that particular therapist. Supervisory sessions also have been presented for discussion and criticism. Material from these sessions has then been used as the basis for discussion to determine our common ground and differences. At other times, the supervisory group has been divided into smaller committees to study various aspects of supervision, training and therapy. The supervisors have worked together to establish criteria for evaluation of progress in training, as well as to study the philosophy, theory and methodology of supervision.

Those who supervise the same therapist are encouraged to consult each other, particularly when their evaluations indicate discrepancies regarding the progress or ability of the supervisee. These consultations are very rewarding and beneficial to the students. The difference in evaluations is often discovered to be due to transference factors revealed in presentations to one supervisor and not revealed in presentation to another. This may be secondary to the therapist's transference reactions to the particular supervisor, or to the particular patient. Some students who have done well with a supervisor of one sex have revealed residual problems when having to work with a supervisor of the alternate sex. As a result, we have learned the wisdom of making sure that each student has worked with female as well as male supervisors and that he has had intensive supervision of a varied caseload. We jokingly refer to the transference a trainee may have to his supervisor as the "super-transference" and the emotional reactions of the latter to the former as the "super-countertransference." The "super-countertransference" is a very real entity that requires greater investigation and study.

Supervisors, as Grotjohn (6) and Balint (3) have pointed out, are in an excellent position to indoctrinate and to impose their viewpoints on students who are dependent, or who feel they have to please in order to pass. Although as supervisors we like to see our thinking accepted and taken up by the students, we are aware that we render ourselves and our students a greater service when our emphasis is on helping the latter to develop their own understanding and way of working. We do, of course, teach them our own approach and thinking, but offer it for their consideration as a step toward integration with their other knowledge. The greatest satisfaction comes from observing how a young therapist grows and develops maturity, utilizing his own creativity to the fullest possible extent.

The effect on the supervisors of these working arrangements is salutary just as it is for the students. Supervisors have had to open their minds as they worked with colleagues just as learned as themselves, but who have different convictions. Those faculty members who have tended to hide behind the authority of their positions find that this is not possible with students who have a respectful but not fearful attitude toward those in authority. They have learned that they have to change and to consider the supervisory relationship as a cooperative procedure.

As a result of the over-all attitude and spirit of the Center, the development of individual disciples and of partisan groupings is minimal. We would consider a disciple-master relationship between a student and a faculty member to be an evidence of pathology on the part of one or the other, or possibly both.

Those of similar orientation have not grouped together to proselytize by the sword. Internecine warfare along theoretical lines has not evolved, largely because it is rare that one is forced to be defensive of his own position. Interestingly enough, many fast friendships have been developed among those who have disagreed most vehemently theoretically.

Many supervisors have found shifts taking place in their own theories and practices. Most have found a broadening and deepening of their own work as new facets of knowledge have appeared as a result of their contact with students and colleagues.

The supervisors, while maintaining their individual positions, have been working towards a common understanding. We have found, for example, that many supposed differences are really non-existent, once semantic and personality factors have been clarified. This leaves only a small core of genuine differences in theory and the interpretation of various phenomena. As time goes on we have compressed this core even further. We are not consciously attempting to work out a new theory that would be binding for all; we are not even attempting to construct an eclectic theory as such. For the faculty or administration to attempt this would lead to a poor compromise with which no one could be satisfied. It is preferable to continue to agree or disagree, as it may occur, and to continue to discuss while ever broadening our areas of agreement and more clearly delineating our differences.

As mentioned earlier, we assume that a good therapist must be sensitive to and understand the latent content of his patient's communications. The supervisors, through their weekly meetings, have reached considerable agreement on recognizing what is the significant latent content in the patient's associations, dreams or behavior in relation to the therapist or others. How we dynamically describe what we all recognize, or how we may deal with it, are among the areas in which there is not unanimity.

Supervisors generally agree on evaluations of students, probably because of this accord on the student's understanding and awareness of latent content. If the student is able to handle the therapeutic situation in a way that is consistent with the latent content and his own theoretical position, we can then assume that he knows what he is doing and why. His therapy, flexible but planned, should broaden the patient's consciousness and change his functioning in keeping with the patient's best interests.

The administration does not utilize the student's analyst in evaluation. We believe that the authority of the training school should enter as little as possible into the student's own analysis. Consistent with this and our other principles, the student may choose his analyst from our own supervisory staff, or from any analytical society that meets the objective criteria of training and experience established by the Center. We do not feel that analysis should be used for indoctrination, or that a therapist must remain in analysis or return to analysis if he does not accept a particular set of theories. We agree with Alexander (2) that progress in analysis and training is best judged by the supervisor's appraisal of work with patients. Successful personal analysis is evidenced in an ability to work in a sensitive, flexible manner, with freedom from countertransference that hampers therapy with others. When countertransference manifestations are brought to light in supervision, the healthy therapist is able to correct his own reactions and to avoid repeating them. Thus, supervision checks on the analysis and makes it unnecessary for the training institution to complicate the trainee's therapeutic relationship with his analyst—a serious problem that has been recognized by most training centers.

Those who have joined our faculty have done so voluntarily. This has provided a natural type of selection of those who profess a desire to work in this kind of setting. All supervisors have changed to some extent through the experiences they have had at the Center. I am aware of only one supervisor who was not able to tolerate sufficiently other viewpoints so that he could feel comfortable with us. He left the staff, feeling that our lack of teaching "just one theory" led to superficiality of theory and therapy. Someone else, in a private discussion, recently expressed a similar idea, saying, in effect, that one must learn a single system completely and thoroughly before one ventures off into other possible theories. (Kubie (7) makes this point too.) I wondered at

that time how many actually do go off to study seriously other approaches once they have been thoroughly indoctrinated in only one. I fear that the mind is open and receptive only before the catechism has been drilled in, vested interests established, and neurotic dependence on the professional "parent" and "family" reinforced by the reality of group acceptance and the economics of earning a livelihood. After full training and indoctrination has taken place, it takes an extraordinary individual to accept and assert his own thinking when it means challenging his authorities.

Is it not more consistent with good pedagogical and scientific principles to teach a student all known knowledge and theory in his field and then to allow him to arrive at his own conclusions without the pressure of having to conform in order to be accepted and to achieve status?

Some, perhaps, confuse depth of therapy with acceptance of dogma. A therapist who is equipped to adapt his techniques and working hypotheses to what he finds in his patients, and who is prepared to examine and to reflect on his patients from many avenues is hardly more superficial than one who approaches them from only one "royal" road. Regardless of theory, the final evaluation must be on the basis of the results of therapy which can be judged only in terms of the totality of the activities and relationships of the patient. To date the few studies made in this area indicate that therapists of one school of thought achieve no better or worse results than those utilizing other theories.

This controversy of theoretical positions reminds me of the many "cures" and treatments for pneumococcal pneumonia in the early thirties. Once sulfanilamide was utilized in controlled studies and its efficacy confirmed by various investigators all over the world, the controversy ended. There remained but one proven treatment of choice. Perhaps when we find the truth in our field, we shall agree too and be able to put aside our pet myths and prejudices. Until that time arrives, however, it is a matter of prudence to present our specific viewpoints with humility.

Conclusion

The effects of this multi-theoretical approach to training are manifold. The spirit and content of the program described are in keeping with the best democratic, scientific and academic traditions. Teaching as much as possible of the total accumulated knowledge in the field and allowing the trainee to arrive at his own conclusions lead to the development of a balanced and mature therapist. The freer the academic setting (with the maintenance of high standards in all areas) the more likely will be the emergence of the student as a mature, flexible and sensitive therapist, prepared to make a creative contribution as a scientist. Faculty members and supervisors have also grown and changed their attitudes as they have worked with colleagues of differing viewpoints. We have demonstrated that it is possible for members of our profession, who adhere to different schools of thought, to work together in a program of training, research and therapeutic services for the benefit of patients and of the community.

BIBLIOGRAPHY

1. Abel, T. M., Oppenheim, S., and Sager, C. J.: Screening applicants in psychoanalytically oriented psychotherapy. *Am. J. Psychotherapy, 10:* 24–39, 1956.
2. Alexander, F.: *Psychoanalysis and Psychotherapy.* New York: W. W. Norton & Co., 1956, pp. 148–172.
3. Balint, M.: On the psychoanalytical training system. *Internat. J. Psycho-Analysis, 29:* 163–173, 1948.
4. von Domarus, *et al.:* Mimeographed Report on Supervision. Postgraduate Center for Psychotherapy, 1956.
5. Gralnick, A.: A postgraduate psychoanalytic training program. *Am. J. Psychiat., 106:* 811–844, 1950.
6. Grotjohn, M.: *Twenty Years of Psychoanalysis.* New York: W. W. Norton & Co., 1953, pp. 84–113.
7. Kubie, L. S.: *Practical and Theoretical Aspects of Psychoanalysis.* New York: International University Press, 1950, pp. 197–213.
8. Martin, P. A.: Note on inhibition of scientific productivity. *Psychoanalyt. Quart., 25:* 415–417, 1956.
9. Sager, C. J.: Aspects of clinical training in psychotherapy. *Am. J. Psychotherapy, 7:* 633–640, 1953.
10. Schwartz, E. K., and Abel, T. M.: The professional education of the psychoanalytic psychotherapist. *Am. J. Psychotherapy, 9:* 253–261, 1955.

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WORKING WITH THE STUTTERING PROBLEM[1]

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Speech is a fundamental aspect of the whole personality. Its function is not only to communicate verbally, but is also an expression of the individual's interpersonal relations.

Speech is considered as our most recently developed, most complex finely balanced muscular activity. Because of its complicated nature, and its numerous nerve areas and muscle groups, which require almost perfect coordination and harmony, it is also an area which is easily prone to disorganization and imperformability during periods of intense emotion.

In this context, we may consider stuttering as an expression of the stutterer's anxiety in his desperate attempts to arrive at psychic unity in the struggle to find himself. In stuttering we find distortions and definite emotional disturbances pertaining to the process of verbalization. Being rendered disorganized and chaotic at the time of his speech difficulty or stuttering, the stutterer is unable to preserve enough of his "real self" to express clearly or directly the real intent of his thoughts and feelings. It is specifically in the speaking situation that he seems to experience most of the destructive threats which endanger his basic security and identity. His stuttering is an external expression of anxiety and contains within its ritualistic process all the neurotic defenses and attempts at solution in his striving toward unity.

In a problem as complex as stuttering, any attempt toward treatment should be composite in nature. Adequate therapy should include investigations of a medical, social, psychiatric and reeducational nature. Stuttering is not to be considered as an isolated disorder of the speech mechanism, but as an outward expression of a more basic character disorganization. Any effective treatment must also be directed toward helping the individual understand his particular neurotic difficulties with their neurotic solutions, and arrive at some resolution of the underlying conflicts.

The goals in treatment have changed considerably from those of our forerunners. Today the emphasis is away from symptoms as the prime expressions of underlying disturbances and toward the treatment of the total personality, the whole man. This holistic approach involves not only the individual's disturbances in relation to others, but the nature and importance of intrapsychic processes. Our responsibility is not only to help the stutterer overcome or alleviate his stuttering, but to find himself as an individual—to release those energies now bottled up in his neurosis toward self-realization, capacities for creative work, better human relationships, and assumption of responsibility for himself.

The belief that stuttering and allied emotional disorders are best treated with a holistic approach instead of symptomatic relief finds common agreement today. Differences among therapists lie chiefly in the different foci of emphasis and in the method of tackling individual character structure. For instance, one common misconception regards stuttering as originating from a single specific cause, secondary to some emotional traumatic event in the person's past, and that if this can only be uncovered, the stuttering will then disappear. Such thinking was influenced by the early studies of Freud and his coworkers in their work on hysteria. From it arises the idea that dramatic cures are possible in stuttering, which has led many stutterers to seek cures of a miraculous nature for symptomatic removal. Though hypnotism and many other brief therapeutic approaches do produce an immediate lessening of the speech difficulty, they accomplish little or nothing in inducing changes in the total personality. A comprehensive therapeutic approach must focus not only on the early development of the individual but also on basic conflicting tendencies through all phases of life, with an understanding of both constructive assets and destructive inhibiting

[1] Material in this paper abstracted from my book, *Stuttering: A Psychodynamic Approach to Its Understanding and Treatment*. New York: Julian Press, 1954.

forces. With all of this pertinent data at hand, therapy may be directed toward a reorientation of the individual by making available to him whatever constructive resources are possible toward healthy growth and away from neurotic development. Once this is accomplished, or is in process of development, we can expect a gradual lessening of anxiety and an amelioration of the symptom of stuttering itself.

A detailed presentation of treatment in stuttering is too highly specialized a task for one paper. Only the basic principles and methods of effective treatment can be summarized here. Aside from the preventive and educational procedures which are of value in all disease entities, treatment in this particular context will be undertaken from a psychiatric or psychotherapeutic approach. The latter is based on the premise that stuttering is an emotional problem, resulting from a faulty development of the individual personality structure.

Since stuttering usually begins at an early age, treatment too should begin as early as possible. For therapeutic purposes we can distinguish two phases of stuttering: primary and secondary. In treatment during the primary stage (five to ten years of age), when the child is less cognizant of and anxious about his speech problem, the approach is mainly one of treating the parents and, through them, removing unfavorable environmental influences. The prime objective is to be able to give support and yet aid the child to lessen the degree of his inner turmoil and conflicts, to attempt to arrest the disorder, and finally, is possible, to prevent perpetuation of the problem into the secondary stage or into confirmed stuttering. The parents or parent surrogates of the stuttering child are made as aware as possible of the many workable means available to ease the demands made upon their children, and how these same pressures can lead to stuttering. An ideal situation, it goes without saying, would be one where either or both of the parents could be encouraged to enter into treatment themselves, to help them work through some of their own most disturbing emotional problems, which in turn would better the child-parent relationship. Where this is not feasible or is met with resistance, treatment of parents must assume the form of specific instructions. These instructions are directed toward 1) improving the general health of the child; 2) the balancing of his environmental tempo, with the removal of some of the more exciting and disturbing tension factors; 3) attempts to encourage in the child a sense of confidence, responsibility, mutual love, and respect; 4) the working toward a sense of coordination and rhythm in the child's personality as a whole; 5) encouragement of the child to feel free to mix freely with other children and especially with members of his own family; 6) encouraging more constructive methods of discipline; 7) enabling the child to grow at his particular pace and helping him find his own potentialities and creative capacities; 8) establishing a feeling of real love, warmth, and mutual belonging in the family unit; 9) and, finally, avoiding making the child feel unique or different from others, and especially avoiding to make him "speech-conscious". In connection with the last-named factor, it is specially urged that the child be allowed to develop a sense of freedom of expression through speech, and a feeling for an independent choice of words. Though these goals may seem to be so comprehensive as to be difficult of attainment, even some partial achievement of them can aid the stuttering child in his later struggles toward self-realization.

In the secondary stage of stuttering (eleven to nineteen years of age), the stutterer is now consciously aware that he has a speech difficulty and is particularly affected by what others think of him. This adolescent or adult stutterer develops a keen sensitivity around his affliction of speech and is easily affected by criticism and his own particular shortcomings. The speaking situation now assumes specific colorings of anxiety and apprehensions, which become embedded in his particular character structure. Treatment in this secondary stage of stuttering, in contrast to that of the primary stage, consists primarily of a direct approach. The individual's problems are tackled directly, and the aim is toward personality reorganization. The difference between treating the adolescent and the adult stutterer is mainly qualitative. It is desirable to treat stutterers in this stage also as early as possible, when they are first aware of their problem, since many conflicts are less entrenched and less

complex in early adolescence than in later adult years. Also, in the early development phases, patients are more aware of their neurotic solutions, which are closer to the surface; they have a greater need and desire to do something about their difficulties, have more available constructive forces, and have less of a neurotic attachment to the symptom of stuttering in itself. Unfortunately, however, the vast majority of stutterers under treatment today are adults. Many of them when children were kept away from treatment through ignorance or "blind spots" in their parents, or else became victims of so-called authorities who advised that they would "outgrow" the disorder. The tragic result was that they discovered too late that they became, instead, chronic stutterers with many more additional conflicting tendencies and a neurotic structure much more difficult to treat.

Treatment in the adult or confirmed stutterer is a difficult, tedious, and serious undertaking. Because of its technical nature, only brief descriptions of the more important phases of its treatment can be mentioned here. Its main goal is to help the stutterer unravel himself and free himself from his neurotic web, so that he can avail himself of constructive forces and energies necessary for healthy growth and self-realization.

The initial interview is also a basic source for a number of important facts and data which the therapist must know about his patient before beginning adequate therapy. Briefly, these include: name; age; sex; marital status; occupation; religion, education; social status; family background; sibling relations; medical history; early childhood; adolescence and adult development; sexual history, etc. During this first interview the patient also describes his immediate symptoms and complaints. (In addition, a detailed record of all symptoms and complaints, and primarily that of stuttering, is of prime importance.) The therapist should ask for information pertaining to the age at onset of stuttering, how and where it started, its connection with any traumatic experience or experiences, and when the patient first began to associate the first objective and subjective feelings of anxiety with his speech defect. In this same orientation, it is important to seek data concerning a specific familial history of stuttering, parental attitudes toward his speaking and toward his speech defect, and, most essential of all, the patient's own feelings and attitudes about his stuttering throughout his remembered development. Finally, for a more complete picture, it is necessary to have some understanding of the patient's present attitudes about his speech impediment, and especially how he experiences himself with it in relation to himself and others. We can now arrive at some beginning working premise of the patient's predominant neurotic solutions, the extent to which he uses his stuttering as a neurotic device, and finally some insight into the degree of alienation present.

It goes without saying that since we are treating the personality as a whole and not the symptom of stuttering in itself, we need to gather as much information as possible regarding the patient himself as a living human being, including both intrapsychic and interpersonal factors. In this sense we may question him about his ways of life, his habits, his likes and dislikes, his preference for others, his capacities, abilities, potentialities; and something about his dreams, phantasies, and imagination. As he speaks, we can also arrive at some of his possible reactions to ourselves as therapists; the manner in which he may attempt to avoid direct answers; the use of "bugaboo" words, or means of rituals and distractions, when he feels he may be about to stutter. These and kindred points of observation are some of the unlimited resources we have at hand in the first few initial interviews, which can be of tremendous importance as we proceed with the therapeutic process.

Before the therapist can plan any direct plan of approach, it is essential that he pull together all these facts and personal observations and make some of his own concluding impressions. At this point he must evaluate to the best of his judgment and therapeutic acumen the following essential basic criteria:

1) The relative degree of constructive assets and real incentives for help present in the patient in relation to opposing negative and retarding forces. Also from what sources at hand, and from those more hidden, can we look for and make available energies toward self-realization.
2) The degree and extent of alienation.
3) The patient's extent of awareness of his

own problems, his real desires for help, the feeling for change, and finally his capacity for cooperation in the therapeutic situation.

4) The degree of severity of his obvious symptoms, and primarily that of his stuttering.
5) Finally, a measure of the patient's awareness of and capacity for struggle, a sense for real suffering, and his threshold for anxiety.

Once the primary objectives are established, and a plan of approach is decided upon by the therapist, then more feasible and productive therapeutic work can begin. In accordance with the original premises of this paper, especially that of promoting self-realization, it is important to recognize early in the therapeutic process the various resistances and blockages which are keeping neurotic processes going and simultaneously are interfering with healthy growth. Since we are primarily interested in helping the patient find himself, we must remove those obstacles which obstruct his growth, interfere with his real self, and cause him to feel alien to himself and to others.

In people who stutter, for instance, there is present a great deal of pride invested in the irrational claims they make upon themselves and others. This area presents tremendous resistance to change. To help the stutterer feel that he is not necessarily a "cripple" because he has difficult speech at times, and therefore is not entitled to any special privileges from others, is a problem most difficult to tackle. This sort of compulsive behavior comes from two basic sources: from a feeling of being victimized and abused since early childhood, and from an imaginative concept of themselves as "chosen people", privileged in every aspect of living.

Unless other factors in the therapeutic situation warrant immediate attention, I feel that this wide area of claims should be tackled immediately, or as soon as feasible. Once the stutterer develops some feeling of rapport, a sense of confidence with his therapist, and has gained supportive ground to stand on, he should be helped to face this problem of claims. This whole area, with its many ramifications, interactions, and consequences, needs to be laid open and worked through before the therapeutic process as a whole can move forward constructively.

Another major problem in the treatment of stuttering is how to encourage the stutterer to stay in and continue with the course of treatment. This, of course, involves first of all an evaluation of the real incentives in the individual patient, and what his specific expectations will be, once he consents to starting therapy.

Since many stutterers may have gone from clinic to clinic, consulted with various specialists, or, in the case of the more unfortunate ones, been subjected to so-called "miraculous cures", some doubts and feelings of doom and hopelessness will have become fixed. As a result, when they are initially interviewed for what they may feel to be "another new and futile attempt, among the many others", they are often skeptical, cautious, and may by this time have little real incentive for receiving help toward solving their problems. It is in relation to this difficult area of resistance that the therapist must give a great deal of himself by way of encouragement. He might begin by giving the patient some pertinent data about his own professional background and experiences with psychological problems, especially with the specific problem of stuttering. He should try to help alleviate the patient's doubts about himself, and some of his anxiety, by putting him at ease and relating to him in a firm but sincere, warm, open and consistent manner. He can further reassure the patient with remarks such as: "Yes, I have no doubts about being able to help you with your problems, provided you are ready to cooperate with me, and help pitch in, so that we can do the job together."

It is especially important that the therapist should not make promises which he does not intend to or cannot fulfill later on. Not only are false promises dishonest, they can lead to catastrophic difficulties in the course of treatment, and may even end in the patient's leaving therapy in a more despairing and disbelieving state of mind than the one in which he entered it. The real facts about his illness and the degree of severity of his complaints (providing they can be presented to the patient without shaking too strongly his already weakened foundation) should be revealed to him so that he can get a realistic perspective.

This may temporarily jar the patient's neurotic status quo, but in the long run it will add to his feelings of respect and sense of mutuality toward the therapist.

Aside from the usual hesitations found in the stutterer's way of speaking, there are present similar inhibitions and blocks in the quality of his productions. In fact, the person who stutters blocks with his whole organism, including his feelings, attitudes, beliefs, and actions.

The stutterer's associations are usually not free and spontaneous in quality. Since this interferes with the progress of treatment, it is imperative that the patient be educated and made aware of this blocking agent early in treatment, in order to promote a more real and "down-to-earth" atmosphere in the therapeutic situation itself. He may bring to his interview an abundance of material, yet it may be of such a reportorial nature that it can have very little real meaning to his actual feelings or conflicts. The therapist should be constantly on the alert for this sort of underproductive activity because it can be deceiving. He should help the patient to look "behind the scenes" of his productions, in order to discover whatever special meanings his associations may convey to his own particular needs, feelings, and motivations at the time of expression. Material which is remote to the patient and felt at a distance to his inner core, or as if coming from somewhere outside of him, leaves very little impression on the patient and brings about little constructive insight. To help the patient at this point to be eager to talk about himself, and be interested in his own welfare, is of great importance.

Among blockages in productivity is, of course, that of the actual stuttering symptom. If a therapist is not thinking of working with the total character structure, he can easily involve himself in a hopeless struggle toward removing the symptom itself. With such an approach, he can easily get caught in a confusing entanglement of intellectual discussions centering mainly around presupposed cause-and-effect correlations of stuttering, losing meanwhile the background of the "whole person". It is important to keep in mind what the stutterer is trying to express each time he speaks, primarily when he is stuttering. The way he presents himself when he speaks, with his many hidden meanings, feeling tones, anxieties, inhibitions, hesitations, and especially his own word jargon, is highly connotative of himself—providing we are there to intercept and decode the message.

Problems found in every other human relationship are just as prevalent in the therapeutic relationship. For instance, the person who stutters makes the same claims on the therapist that he may make upon others, and this tends ultimately to hinder the therapeutic progress. His glorified self strives for absolute productivity; he meets reversals with despair and hopelessness. He feels obliged to find a rapid solution to his conflicts without sincere motive or realistic effort. From his therapist he may demand not only perfection but also immediate, absolute attention at all times. He may expect the therapist to make more frequent interpretations and to work with him more actively. But at the same time he becomes very antagonistic and resistant toward making any compromises or sacrifices himself; he feels that his mere presence entitles him to change.

Another formidable obstructing force in the therapeutic relationship is that of the patient's use of magical claims. He externalizes his own feelings of magic onto the therapist, and endows him with special superhuman powers impossible to attain. He feels that his therapist should be a magician who can, without the slightest effort, pull him out of his dilemma. The person who stutters may use his stuttering with all of its distractions and rituals as a powerful means of keeping his therapist off guard, and thus in a less threatening position to his neurotic solutions. It is of utmost importance for the therapist to maintain a balanced, firm, and consistent position in spite of the patient's attempts to keep him off guard and in an inferior status. Though the patient may appear to battle firmness or consistency in the therapist, he secretly and basically desires it. It will ultimately give him a sense of security and a feeling of real respect and regard for his therapist.

Finally, the stutterer is in constant fear and dread of having his protective structures invaded or removed, because of the accompanying terror of crumbling and psychically "going to pieces". His constant need for mastery, especially in the speaking situation,

causes him to generate feelings of self-hate whenever his pride values in this direction are undermined. Unable to face his conflicts squarely or to bear their accompanying anxiety, he is prone to fall back too quickly on old defense measures in pleading helplessness and having abused feelings. The more desperate he feels his situation to be, the greater the number of strategies needed to cope with his endangered position. His last area of retreat, at least in his way of thinking, is finally that of avoiding conflict altogether, by resigning himself to a state of pseudo-unity—thus being able to save face in at least part of the struggle.

As the patient desperately attempts to hold onto his neurotic status quo, the therapist must not add to the struggle by hitting back, forcibly pulling against him, or trying to impress him with his superior intellect. The problem is not just one of "digging" the patient out of his entrenched position, but of coming to an understanding of his role in the particular conflicting situation. By helping him to look at the possible reasons behind his fear of letting go of old neurotic protective defenses, and more specifically what he feels endangered by, or essentially what dangers he feels he is warding off, the patient can slowly come to a realistic understanding of his struggle between self-idealization and self-realization.

It is essential that the person who stutters begins to see himself less as "just a stutterer", and more to have feelings for himself as a human being, in spite of his stuttering. Once he is encouraged to feel less hopeless, resigned, and frustrated, the more firm ground can he feel himself to stand on. As a result, he will feel less threatened from his "lofty position", feel less anxious, and will then have the courage to face himself as he really is, to take a stand in relation to his conflicts, and to have courage to change.

As the neurotic process, including that of stuttering, unfolds itself, the individual gradually learns to know himself in a more realistic sense by relinquishing many illusory notions he once built about his lofty structure. Besides this, he will have greater courage and confidence in his ability to take over his own responsibilities and to choose and chart his own particular way of life. He will also learn to give up many of his imaginative magic powers and face realities with his own existing resources. In the process of growing, he will accept himself as he is with all of his difficulties, and accept the development of himself as an integral part of the process of living.

In the final analysis, as the stutterer slowly finds himself in the process toward self-realization, so will he tend to discard his neurosis and all that it implies—including that of stuttering.

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A COMPARISON OF MONOUREIDE AND DIUREIDE SEDATIVES

With Respect to Drug Habituation, Untoward Effects and Mortality Rates

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The high tension and insecurity of modern life have led to a great increase in the occurrence of anxiety, nervous unrest and insomnia. The need for a safe, effective and non-habit-forming sedative and somnifacient is apparent, in view of the dangers and widespread abuse of the barbiturates (diureides).

Many physicians believe that barbituric addiction is the worst drug habit. It produces greater mental, emotional and neurological impairment than morphine. Withdrawal causes real hazards (6).

Barbiturates are all habit-forming. They are diureides (diacyl ureas); i.e., their molecular structure is a closed cycle. Characteristically, they are slowly eliminated from the system, and this fact accounts for the resulting hangover, nausea and other side effects, as well as their relatively low safety factor due to the cumulative effect from slow elimination.

In developing an alternative with equal tranquillizing action in nervous anxiety and insomnia cases, the research worked from this statement of the problem: Can we obtain equal tranquillizing effect without the habituation danger and without the side effects of barbiturates?

To this end we investigated a combination[4] of two monoureide sedatives both derived from carbromal: namely, acetylcarbromal and bromisovalum (bromural).

Used singly, acetylcarbromal and bromisovalum are weak sedatives. But our studies demonstrated that when they are used together in a single compound, the tranquillizing and sedative effects are unexpectedly high. As shown in a subsequent report (4) of 150 case studies, the combination was significantly more effective both as a sedative and somnifacient than double doses of either acetylcarbromal or bromisovalum.

The present paper supplies clinical evidence to establish that both of these monoureide sedatives, whether used singly or in combination, are safe and completely non-habit-forming.

CRITERIA OF DRUG HABITUATION

Investigation of the habit-forming qualities of a drug depends upon the appearance of four main syndromes classified as follows with respect to their characteristic signs:

1) *Pleasurable sensations*
   - (a) euphoria
   - (b) ecstasy
   - (c) erotic dreams
   - (d) sense of floating
   - (e) body glow tingling
2) *Tolerance*
   - (a) increased dosage needed to produce same effect after continued use of the drug
3) *Psychological craving*
   - (a) begging for the drug
   - (b) stealing the drug
   - (c) bribing the druggist
4) *Withdrawal symptoms*
   - (a) unusual skin sensitivity
   - (b) auditory and cutaneous reactions
   - (c) vomiting
   - (d) diarrhea
   - (e) hallucinations
   - (f) excitement
   - (g) despondency
   - (h) convulsions

BARBITURATE HABITUATION

The incidence of barbiturate habituation is common and appears to be on the increase (6). In Hambourger's (10) survey, the barbiturates accounted for more than 10 per cent of all

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[2] Formerly Director of Medicine at Kings County Hospital, Brooklyn, New York.
[3] Chemist, Brooklyn, New York.
[4] This combination was supplied as Sedayson tablets by Tailby-Nason Company, Inc., Dover, Delaware. Each tablet contains acetylcarbromal, 150 mg., and bromisovalum, 100 mg.

TABLE 1.—SUICIDAL AND ACCIDENTAL BARBITURATE DEATHS COMPILED FROM OFFICIAL RECORDS 1950–53

City	Total Deaths	Suicidal	Accidental
New York	645	409	236
San Francisco	227	154	73

addiction cases (exclusive of chronic alcoholism) admitted to thirteen hospitals. Two-thirds of these addicts claimed that they became familiar with the drug through a physician.

All of the criteria of drug habituation which we have described under the headings of pleasurable sensations, tolerance, psychological craving and withdrawal symptoms have been reported repeatedly in medical literature by numerous observers. Their occurrence is common and serious, sometimes fatal.

For an excellent summary of barbiturate addiction and its manifestations, it is suggested that the interested reader consult Goodman and Gilman (8). Other important sources of information on this subject include Cook and Martin (2), Sollmann (20), Modell (17), Isbell and Fraser (15), Cushny (3), Wikler *et al.* (21), Galambos (5), Milburn (16), Hewitt (12), and Morgan (19).

ACETYLCARBROMAL AND BROMISOVALUM NOT HABITUATING

The barbiturates are diureides (diacyl ureas). They are all habit-forming.

The monoureides (monoacyl ureas) include principally carbromal and its derivatives acetylcarbromal and bromisovalum (bromural). Because of a chemical relationship, the monoureides have been classified mistakenly as habit-forming, on a purely theoretical basis and without clinical evidence. One cannot predict the physiological action of a drug with any degree of certainty from its chemical structure.

As will be shown in this report, three separate clinical investigations including a total of 371 case studies showed complete absence of any habituating effects following continued administration of acetylcarbromal or bromisovalum (bromural) or of acetylcarbromal and bromisovalum in combination, respectively.

A comprehensive survey of medical literature disclosed no definite report to the effect that either acetylcarbromal or bromisovalum is habit forming. We could not find a single case report of habituation resulting from the use of either of these drugs.

In a monograph on the open-chain ureide sedatives (including acetylcarbromal and bromisovalum), Hobart (13) in 1951 reported results of 144 cases in which these drugs were used. He concluded that "the 'automatism' which may occur with barbiturates is unknown, and there is apparently no danger, whatever, of a drug 'crave' developing."

Combes (1) in 1952–53 gave the acetylcarbromal, 150 mg., plus bromisovalum, 100 mg., tablets to 37 patients who complained of itching due to various dermatoses and in addition more or less sleeplessness. Medication was continued in daily dosages up to a maximum of 2 tablets every four hours and 3 at bedtime for periods ranging from one month to 22 weeks. The group included 12 men ranging in age from 32 to 84 and 25 females ranging in age from 4 to 75. Associated systemic diseases included essential hypertension, diabetes mellitus, cardiovascular disease, hepatic cirrhosis, chronic nephritis, cardiac palpitation, arteriosclerosis, and various types of neuroses.

In addition to the study of therapeutic efficacy, a primary consideration was the determination of possible habituation to the drug. The findings in this group as well as in subsequent cases similarly treated were completely negative as to any observation related to drug habituation. Combes concluded that acetylcarbromal and bromisovalum, used separately or in combination, are non-habit-forming drugs.

Our own investigation to determine whether acetylcarbromal and bromisovalum, singly or in combination, are habit-forming included a total of 190 case studies as follows: 50 cases with acetylcarbromal, 50 with bromisovalum, and 90 with acetylcarbromal-bromisovalum combination.

The dosages employed were as follows:

Acetylcarbromal, 300 mg., 6 tablets daily as a sedative, 8 tablets daily as a somnifacient.

Bromisovalum, 200 mg., 6 tablets daily as a sedative, 8 tablets daily as a somnifacient.

Acetylcarbromal, 150 mg., in combination

with bromisovalum, 100 mg., 6 tablets daily as a sedative, 8 tablets daily as a somnifacient.

All patients were observed closely for possible development of any of the manifestations of pleasurable sensations, tolerance, psychological craving or withdrawal symptoms described in our criteria of drug habituation. Close observation was maintained immediately after medication was discontinued and continued for an adequate period of weeks after use of the drugs was stopped.

There was not a single manifestation of drug habituation in any of the 190 case studies.

From the results reported in this paper, plus our survey of medical literature and the independent reports by Hobart and Combes, we have reached the definite conclusion that acetylcarbromal and bromisovalum are non-habit-forming, whether used singly or in combination.

Untoward Effects

The untoward effects of the barbiturates are common and notorious, especially in the fields of psychiatry and neurology. They have been described by Goodman and Gilman (9) as follows:

"*Mental changes* include sluggishness, difficulty in thinking, slowness of speech and comprehension, poor memory, faulty judgment, narrowed range of attention, emotional lability, exaggeration of basic personality traits, irritability, quarrelsomeness, moroseness, crying or laughing without adequate provocation, untidiness in personal habits, hostile and paranoid ideas, and suicidal tendency. The addict may regress to such an infantile level that he is unable to take care of his wants. Occasionally, an acute toxic psychosis may develop in which confusion, disorientation, fear, delusions, and vivid visual hallucinations are prominent features; this is more apt to occur if a large amount is ingested or the dose elevated rapidly. The psychic and psychomotor effects of chronic barbiturate intoxication have been studied and analyzed in detail (*see* Kornetsky, 1951; Hill and Belleville, 1953). *Neurological effects* are characteristic and consist in thick slurred speech, nystagmus, diplopia, strabismus, difficulty in accommodation, vertigo, ataxia in gait and station, hypotonia, weakness of the limbs, tremor, dysmetria, and decreased superficial reflexes; deep reflexes, pupillary responses, and sensation are usually unaltered. Occasionally transient ankle clonus and Babinski signs are elicitable.

"In addition, certain patients have gastrointestinal disturbances manifested by anorexia, obstipation, foul breath, and coated tongue, but nutrition is unimpaired. Skin rashes may develop; they may be erythematous, urticarial, purpuric, or scarlatiniform in character. The rash caused by phenobarbital may itch and may resemble the exanthem of measles without Koplik's spots, or of scarlet fever without the circumoral pallor. A rash may appear on the tongue after prolonged use of phenobarbital. Rarely, fatal exfoliative dermatitis has occurred. The urine may contain albumin, casts, and hematoporphyrin."

The safety of acetylcarbromal and bromisovalum (bromural) offers a sharp contrast to the high toxicity of the barbiturates.

In a total of 190 cases treated with acetylcarbromal, bromisovalum and the acetylcarbromal-bromisovalum combination, respectively, there were no untoward effects which could be attributed to the medication. There were three cases in which the treatment was discontinued because the symptoms appeared to be aggravated, one because of headache and one because of a rash. These results could readily have been coincidental.

Goodman and Gilman (7) state that the monoureides (including carbromal, acetylcarbromal and bromisovalum) "are decomposed in the body to urea and readily eliminated, their margin of safety thus being large."

In his monograph on the open-chain ureide sedatives, Hobart (14) writes of carbromal, acetylcarbromal and bromisovalum as follows:

"The open-chain ureides under review are exceedingly well-tolerated, even by young babies, and they have been employed as soporifics in cases of chronic nephroses without deleterious result. Gastric and renal irritation are practically non-existent as side-effects. Even following prolonged administration there are no signs of hepatic impairment or damage to the central nervous system."

Mortality Statistics

A comprehensive survey of medical literature failed to disclose a single case in which death

was due to acetylcarbromal or bromisovalum. Hobart (14) reports cases where quantities varying from 60 to 600 grains were taken with suicidal intent without harm arising. This is an enormous margin of safety since each tablet of the medication herein investigated contains only 2½ grains of acetylcarbromal and 1⅔ grains of bromisovalum. As Hobart (14) says, "it follows that these drugs may safely be prescribed to neurotics in whose hands barbiturates and other potent hypnotic drugs are potentially dangerous."

The statistics of suicidal and accidental deaths due to barbiturates which we have obtained from official records provide a sharp contrast with the safety of the monoureide sedatives.

Moore, Alexander and Ipsen (18) in 1952 reported 377 deaths due to barbiturates in Massachusetts in a period of eleven years. Hargrove, Bennett and Ford (11) stated that in 1951 the barbiturates caused more than 1,000 recorded deaths. Recent life insurance statistics show that the barbiturates cause 6 per cent of suicidal and 18 per cent of accidental deaths.

Conclusions

1. Three separate clinical investigations, including a total of 371 case studies and a comprehensive survey of medical literature, failed to show a single case or manifestation of drug habituation following continued use of acetylcarbromal or bromisovalum (bromural), singly or in combination.

2. The absence of untoward effects attributed to acetylcarbromal or bromisovalum is in sharp contrast to the frequent and serious neurological and psychiatric manifestations reported and the common occurrence of drug habituation following use of the barbiturates.

3. Due to the fact that the monoureide sedatives are non-habit-forming, have no side effects, no hangover and no contraindications, we believe that the acetylcarbromal-bromisovalum combination is much preferable for continued use as a sedative or somnifacient to the dangerous and habit-forming barbiturates.

BIBLIOGRAPHY

1. Combes, F. C.: Personal communication.
2. Cook, W. F., and Martin, E. W.: *Remington's Practice of Pharmacy,* 11th ed., Easton, Pa., Mack, 1956, p. 766.
3. Cushny, A. R.: *Pharmacology and Therapeutics,* 12th ed., Phila., Lea & Febiger, 1940, p. 365.
4. Feinblatt, T. M., Feinblatt, H. M., and Ferguson, E. A., Jr.: Acetylcarbromal and Bromisovalum in Combination—an Effective Sedative and Somnifacient with Positive Synergism. Submitted for publication.
5. Galambos, A.: Antihistaminics as Substitutes for Barbiturates. *New York J. Med., 55:* 663, 1955.
6. Goodman, L. S., and Gilman, A.: *Pharmacological Basis of Therapeutics,* 2nd ed., N. Y., MacMillan, 1955, pp. 134, 150.
7. Ibid.: p. 124.
8. Ibid.: ref., pp. 134, 145–153.
9. Ibid.: p. 151.
10. Hambourger, W. E.: The Promiscuous Use of the Barbiturates—an Analysis of Hospital Data. *J. A. M. A., 114:* 2015, 1940.
11. Hargrove, E. A., Bennett, A. E., and Ford, F. R.: Acute and Chronic Barbiturate Intoxication—Recent Advances in Therapeutic Management. *California Med., 77:* 383, 1952.
12. Hewitt, R. T.: Psychosis with Barbiturate Withdrawal. *J. Nerv. & Ment. Dis., 112:* 526, 1950.
13. Hobart, F. G.: *Open-Chain Ureide Sedatives.* London, Leonard Hill, 1951, pp. 14–15, 19.
14. Ibid.: p. 19.
15. Isbell, H., and Fraser, H. F.: Addiction to Analgesics and Barbiturates. *J. Pharmacol. & Exper. Therap., 99:* 355, 1950.
16. Milburn, A. A.: Observations and Manifestations of Chronic Barbiturate Intoxication. *West Virginia M. J., 49:* 254, 1953.
17. Modell, W.: Barbiturate Addiction. *J. A. M. A., 149:* 435, 1952 (abstract).
18. Moore, M., Alexander, L., and Ipsen, J., Jr.: Deaths from Poisoning—Massachusetts, 1938–1948. *New England J. Med., 246:* 46, 1952.
19. Morgan, N. C.: Psychosis Resulting from Barbiturate Withdrawal. *J. A. M. A., 149:* 759, 1952.
20. Sollmann, T.: *Manual of Pharmacology,* 7th ed. Phila., Saunders, 1948, p. 689.
21. Wikler, A. *et al.:* Electroencephalograms during Cycles of Addiction to Barbiturates in Man. *Electroencephalog. & Clin. Neurophysiol., 7:* 1, 1955.

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XANTHOMA OF THE CHOROID PLEXUS IN A CHILD

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In an excellent review of the subject Wolf, Cowen and Graham (2) state that in a series of 1,181 consecutive brain examinations at autopsy, 20 examples of choroid plexus xanthoma have been encountered. Their subjects ranged in age from 40 to 79 years. In the literature, I could find no reference to xanthoma of the choroid plexus in a child. When I first examined the histologic specimen, it was my opinion that this was granulomatous material in the light of the following findings: 1) areas of lymphocytic infiltration, 2) occasional giant cells, 3) excessive vascularity, 4) fatty elements, 5) hematoidin crystals. However, our hospital pathologist, Dr. Grishman, after showing the slide to Drs. Abner Wolf and I. H. Feigin, expressed the opinion that we were dealing with xanthoma of the choroid plexus (see figs. 1 and 2).

Case History

Patient referred by Dr. William Bronson. Female, white, age 7 years, right handed, intelligent and cooperative. One month before the neurological examination, the child began to complain of "quivering of her eyes", difficulty in viewing objects unless she held her

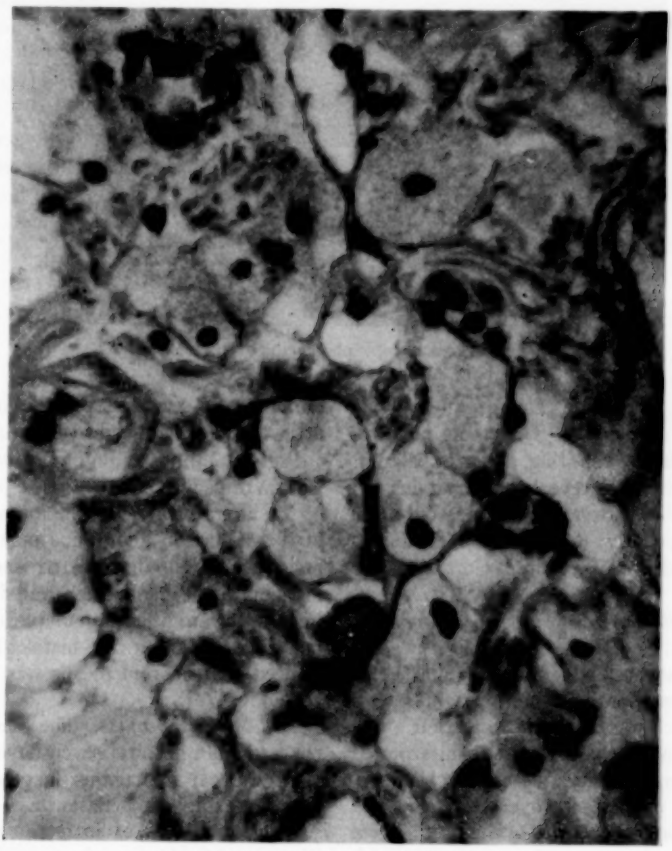

Fig. 1. Microscopic photograph of specimen

FIG. 2. Microscopic photograph of specimen

head tilted to one side, and dizziness while riding in an automobile. There was no complaint of headache, vomiting, or loss of balance.

The examination revealed nystagmus on central as well as lateral gaze, congested optic discs and hypoactive deep reflexes. There was no other evidence of vestibular or cerebellar pathology.

Skull x-rays showed an erosion in the right occipital area.

The pneumoencephalogram showed a poorly visualized posterior horn of the right lateral ventricle which was displaced to the left.

The electroencephalogram was interpreted as being abnormal by virtue of slow wave activity noted particularly over the right mid and postero-lateral portions of the head. These findings were thought to be compatible with either a deep seated cerebral lesion within the areas noted or with right cerebellar pathology.

Right occipital craniotomy revealed a grayish-tan mass in the region of the posterior horn of the lateral ventricle. The mass was the size of a small plum about one inch by $\frac{3}{4}$ of an inch, fairly well demarcated and seemed to invaginate the ventricular wall from without inward toward the choroid plexus but not a part of it. However, the histological specimen showed that choroid plexus was incorporated within it.

Post-operative course. The child was discharged from hospital seven days after operation. Central nystagmus is gone but slight lateral nystagmus persists. Eye consultation revealed no signs of intracranial pathology. The visual fields showed minimal constriction

compatible with the site of the operative pathological lesion. The patient has returned to school, keeps her head straight, is not dizzy and in every way acts like a normal, happy youngster.

Pathologic Report. Gross: "Specimen consists of numerous small, irregular pieces of brain tissue, measuring together 4 x 3 x 2 cm. They are soft and grayish tan in color."

Microscopic: "Section shows a bean sized mass composed of connective tissue stroma and many large foam cells with small, regular nuclei. The tumor shows also many blood vessels and is covered by ependyma."

Diagnosis: "Xanthoma of the choroid plexus" (see figs. 1 and 2). The histologic material fitted in the description of Pinkus and Pick (1) in that there were to be seen large cells with doubly refractive, free material and occasional foreign body giant cells.

Wolf, Cowen, and Graham (2) in addition show in their illustrations the presence of fibrosis, lymphocytic infiltration and a psammoma body.

One corner of our specimen showed calcareous granules lymphocytic infiltration, but little fibrosis could be seen. All in all, the specimen from its gross description, anatomical situation and histologic appearance seems to fit the diagnosis of xanthoma of the choroid plexus.

No chemical tests to confirm the presence of cholesterol were performed.

Summary

Xanthoma in a seven-year-old child is described. This mass caused clinical complaints relieved in the main part by surgical removal. This condition has not been previously described as occurring in children or causing clinical complaints.

The author is grateful for the help of Drs. A. Wolf, I. H. Feigin, and E. Grishman with the pathological diagnosis.

BIBLIOGRAPHY

1. Pinkus, F., and Pick, L.: Zur Struktur and Genese der symptomatischen Xanthome. *Deutsche med. Wchnschr., 34:* 1426, 1908.
2. Wolf, A., Cowen, D., and Graham, S.: Xanthomas of the choroid plexus in man. *J. Neuropath. & Exper. Neurol., 9:* 286, 1950.

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BOOK NOTES AND REVIEWS

Books received are acknowledged and given a brief description in this section. Selections serving a variety of interests will be made from these for a more extensive review, as far as space will allow.

BOOK NOTES

Faust, Clemens. DAS KLINISCHE BILD DER DAUERFOLGEN NACH HIRNVERLETZUNG. [Stuttgart: G. Thieme Verlag, 1956. Pp. ii + 91. $1.85.]

This short, paper-bound, monograph on the clinical picture of permanent sequellae of brain lesions was written by a docent of the University of Freiburg. While the literature on early and acute brain lesion cases is extensive, relatively little is published on the chronic or permanent changes, sensori-motor and psychological. Faust covers the German literature on this subject rather thoroughly and makes numerous references to American, English and French contributions. The list of references is very long and helpful both to clinicians and researchers. The presentation is succinct. Of particular value are the evaluations of the reliability and validity degrees of the examination methods and of the difficulty encountered in ascertaining many permanent changes. There is a three page chapter on the methods of investigation. No mention is made of psychological test procedures although they can be of greater aid in evaluating loss of mental and sensory function in neurological cases than in any other special field of neuropsychiatry, and frequently can perform this job better than clinical examinations. There are now many well trained clinical psychologists in Western Germany who could perform useful service. The monograph is written with compensation cases clearly in mind. The author had carried out follow-up studies on an unspecified number of cases and acquired invaluable knowledge. It seems futile to expect great and sound advances in neuropsychiatry without careful follow-up examinations. Among the numerous points discussed in this well written little book is the relationship of psychoneurosis to cerebral lesions. This new contribution will be of greatest value to the neurological clinician.

Bender, Lauretta. A DYNAMIC PSYCHOPATHOLOGY OF CHILDHOOD. [Springfield, Ill.: Charles C Thomas, 1954. Pp. 275, 17 illustrations. $7.50.]

This is the third book of the Bellevue Studies of Child Psychiatry. The first book was concerned with child psychiatric techniques and the second with aggression, hostility and anxiety in children. The studies are presented in a collection of papers by Paul Schilder and Dr. Bender and others who have been associated with them for some twenty years. A paragraph in the Foreword expresses briefly and clearly the nature of the contents: "This book deals with the various areas of psychopathological responses in the child frustrated by problems, their expression during childhood, and their influence on the subsequent development of the personality in adolescence and early adulthood. Rather detailed case reports are presented on 90 children with follow-up social histories wherever possible. In addition more casual observations and responses to questionnaires are recorded on nearly 200 other children."

The ten chapters include accounts of the psychology of the development of language and the symbol, hallucinations in children, imaginary companions, internalization of fantasy objects, impulsions, compulsions and obsessions, sexual expressions, the reaction to death in the family, psychoanalytic interpretations of the story of Alice in Wonderland, the comic book situation and children's reactions to war. The illustrations reproduce the drawings of children representing various conflicts and ideas relating to the confronting problems.

Like the other books in this series by these experienced authors, this one contains a great wealth of information valuable not only for child psychiatrists and pediatricians, but for

all psychiatrists, psychologists and social workers who should be well oriented in the development and problems of the child regardless of the subspecialty in which they may be currently engaged. It is a splendid job of bookmaking on the part of the publishers.

Kline, Nathan S. (Editor) PSYCHOPHARMACOLOGY. [Washington, D.C.: American association for the Advancement of Science Publication #42, 1956. Pp. 165. $3.50 ($3.00 to members of A.A.A.S.)]

This little book consists of ten clinical papers and conference discussions presented in a symposium organized by the Section on Medical Sciences of the A.A.A.S. and the American Psychiatric Association at the Berkeley Meeting, December 30, 1954.

These articles cover the experiences, theories, hypotheses and opinions relating to the clinical effects and results of the use of Chlorpromazine, Reserpine, Mescaline and some of the other drugs having an action on the nervous system. As a whole, the reports are somewhat confusing but are particularly valuable in indicating the need and the areas for additional research. Since much in the line of pharmacotherapy is in stages of hypothesis and as there is still a considerable amount of disagreement among workers and authors, the book should aid in pointing out the gaps in knowledge.

The contributors are all well recognized investigators and clinical workers who are continuing to gain experience in the drug therapies and their conclusions up to the date of this book are well worth the attention of psychiatrists, neurologists and pharmacologists.

Abramson, H. A. (Editor) NEUROPHARMACOLOGY (TRANSACTIONS OF THE SECOND CONFERENCE). [New York: Josiah Macy, Jr. Foundation, 1956. Pp. 328, Illustrated. $4.25.]

This volume is a verbatim account of a three day conference held in May, 1955, sponsored by the Josiah Macy Jr. Foundation. This conference has followed the pattern of many others supported by the Foundation. Here 25 scientists and clinical workers representing rather widely diverse disciplines each outstanding in his field were invited to convene in sessions devoted mainly to a discussion of the effects of the psychosomimetic drugs and their relationship to schizophrenic states.

Among the fields represented were neuroanatomy, biochemistry, physiology, psychology and clinical and experimental psychiatry, and the special topics presented by individual investigators and discussed by the group were (1) Lysergic Acid Diethylamide (L.S.D.) and Related Compounds, (2) Effect of Drugs on the Behavior of Animals and on Psychoses of Man, (3) Research on Schizophrenia, (4) Experimentally Induced Psychoses in Man, and (5) Tolerance to L.S.D.-25 and a Theory of Psychoses.

The discussions while lively and interesting, were basically not particularly weighted with new information for one who is working in this field of experimentation. For those not well oriented a valuable insight into the current results with the neuroleptic drugs may be gained by following through the conference sessions.

BOOK REVIEWS

Hall, Calvin S., and Lindzey, Gardner. THEORIES OF PERSONALITY. [New York: John Wiley & Sons, 1957. Pp. xi + 572. $6.50]

Many psychologists are now intensely interested in developing and promoting theories of personality. Numerous articles and books appear on this subject. However, since it is about as difficult to create a personality theory as it is to produce a masterpiece in art, most publications deal with presentations, summaries and criticisms of known theories rather than with the advancement of new ones. This particular volume has several features which distinguish it from other books with the same or similar purpose. In the first place it probably includes the most comprehensive list of theorists reviewed within the

covers of one book. The work of the following men is reviewed (in the order in which their names are listed): S. Freud, C. Jung, A. Adler, E. Fromm, K. Horney, H. Sullivan, H. Murray, K. Lewin, G. Allport, K. Goldstein, A. Angyal, W. H. Sheldon, H. Eysenck, R. Cattell, J. Dollard and N. Miller, C. Rogers, and G. Murphy. Many other writers receive brief mention in connection with some special modifications of concepts or procedures of investigation. In the second place, it is individual authors who are discussed and not schools or methods. Thus the views of a number of individual psychoanalysts are taken up one after another and no attempt is made to reconcile the differences among the many analytic schools. This facilitates the presentation and documentation of the discussion and makes it easier for the reader to follow the text. Furthermore, since all theories are reviewed by the same authors, there is much more uniformity in the handling of the theories than is the case in collective books in which each theory is discussed by someone else. Hall and Lindzey offer rather extensive reviews, more detailed and more systematic than in most publications of this kind. In each case, they begin with an uncritical and sympathetic summary emphasizing concepts, assumptions and other aspects of methodology. They then describe the limitations and review some of the criticisms which were levelled at the theories. The authors point out that none of the theories is sufficiently comprehensive to explain the total personality and none is adequately validated; they are "pretty poor theories." In the introductory chapter, Hall and Lindzey discuss the concept of personality and the theory of theory. This chapter is not as complete, logically orderly and lucid in exposition as the main part of their book. In fact, the authors reassure the reader that their discourse on methodology "is not essential in order to read and appreciate the remainder of the volume." They conclude their analysis with a table showing a "dimensional comparison of (seventeen) theories of personality." The 18 "dimensions" used to rate and classify the theories are divided into three degrees: high (considered to be a very important factor by the theory), moderate, and low (considered an unimportant factor by the theory). Some of the "dimensions" are: purpose, unconscious determinants, learning process, heredity, early developmental experience, psychological environment, self concept, multiplicity of motives, etc. It goes without saying that the essential differences among most of the theories are slight. The book is written as a textbook for psychology students and seems to be well suited for this purpose.

Z. A. PIOTROWSKI

McCary, J. L. (ed.) PSYCHOLOGY OF PERSONALITY: SIX MODERN APPROACHES. [New York: Logos Press, 1956 Pp. xvi + 383. $6.75]

This book, edited by J. L. McCary of the University of Houston grew out of a series of lectures in psychology, delivered at the University of Houston. The first chapter, "Psychoanalytic Theory of Personality" by Leopold Bellak, is a popular and rather hurried survey of psychoanalytic concepts. The author sees no difficulties in psychoanalytic theory: all that is needed is to make explicit what is implicit in Freud and his chief disciples. In keeping with a modern trend, Bellak diminishes the significance of the unconscious: "Unconsciousness is but a necessary construction, subsidiary to . . . the continuity of personality." There is nothing specifically psychoanalytic about this definition. It merely states that we continue being the same persons despite the fact that we are not conscious of ourselves all the time. The specific nature of the Freudian unconscious and the logical requirements of an adequate explanation of the mechanism of repression (of forcing conscious material into the unconscious and keeping it there) are not discussed. Such a discussion is necessary to give a satisfactory theoretical account of the relation between the ego and the id. Without clarity in this area, there is danger that the remarkable growth of ego-psychology (i.e., of what in essence is a pre-Freudian psychology of the conscious) will kill what is specifically psychoanalytic, i.e., Freud's or Jung's concepts of the unconscious. Bellak's exposition is an example of the modern trend to integrate psychoanalysis into traditional psychology. If this synthesis is completed successfully, personology will benefit from this mutual assimilation. The second chapter by Raymond Cattell, "Personality and Motivation Theory

Based on Structural Measurement", is an explanation of the application of the statistical factor analysis to personality investigation. Factor analysis can be applied to a set of correlational coefficients among any measures of personality, but so far it has been used almost exclusively with paper-and-pencil questionnaires. The structure that is "measured" in factor analysis is not the personality of an individual but the mathematical relations between scores on test items within groups of individuals. What the factors, obtained through mathematical manipulations, mean is not known. Factor analysis, then, gives specific measures of unknown qualities, which is not very helpful in the study of individuals. It takes great discipline to prevent arbitrariness or magical thinking from creeping into conclusions drawn from factor analysis if this kind of analysis is to be something more than an exercise in computation. Cattell makes a spirited defense of factor analysis. However, all the good things he promises are a matter of the future. To date Cattell's analysis of millions of correlations has yielded "twelve best-established (pairs of) source traits", which he described in the familiar and not too precise terms of "cyclothemia versus schizothymia", "mental capacity versus mental defect", "dominance versus submissiveness", "immunity versus reactivity to threats", "ease versus concern", "sophistication versus simplicity", etc. Cattell presents the methodology of factor analysis in simple terms to give the uninitiated an idea of the possibilities and limitations of this statistical procedure. The third chapter on "Perception, Motives and Personality" by George Klein touches on one of the most fundamental epistemological problems, the difference between philosophical realism and idealism regarding the nature of reality. However, the epistemological basis of this problem is avoided and the matter is treated on a psychological level. The question examined is the degree to which desires influence apparent sensory aspects of perceived objects; e.g., poor children tend to overestimate the size of perceived coins, while well-to-do children who have never experienced real hunger are more accurate in estimating the size of coins. Differences in estimates attributed to psychological attitudes are not conspicuous but can be demonstrated by a comparison of group averages. It is good that this problem, which was studied experimentally in the last century and more recently by Poetzl and Michotte, has been taken up anew. It may eventually lead to the discovery of a complete set of perceptanalytic principles, i.e., laws governing the relation between measurable aspects of visual perception and specific personality traits. Klein formulates well many issues involved in the relation between activity (motives) and sensory perception.

In her "Cross-cultural Approach to the Study of Personality", Margaret Mead points out the great influence of cultural backgrounds upon the attitudes and behavior of individuals. The chapter is enlivened by many examples taken from anthropology. Increasingly complex international relations call for a cross-cultural approach to personality investigation. Nevitt Sanford's "Approach of the Authoritarian Personality" deals with a specific problem, the psychology of the authoritarian personality, rather than a method or theory. The main source of information was questionnaires but these were supplemented by personal interviews. Psychoanalytic concepts (relating to power struggles within the family, especially with parents) are used to provide a theoretical basis for the generalizations. This chapter gives a good discussion of traits associated with the extremes of a continuum from a rigid and authoritarian manipulation of others to an easygoing attitude of "live and let live." The sixth chapter, "Personality, an Integrative View" by David McClelland also differs from the rest. It attempts to summarize and integrate what the other contributors to this book have said. McClelland reconciles differences by stating that the method of each contributor tries to elucidate a different problem of personality theory. The different methods cannot be harmoniously synthesized in their present state but he sees no reason why this synthesis should not be feasible in the future after each approach will have been modified and corrected. Two methodological approaches, behaviorism and genetics, have not been discussed in this volume. However, this readable book airs many problems occupying modern personality theories.

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Diethelm, Oskar (ed.) ETIOLOGY OF CHRONIC ALCOHOLISM. [Springfield, Ill: Charles C Thomas, 1955. Pp. ix + 229. $6.75.]

A group of investigators under the direction of Oskar Diethelm, professor of psychiatry in the Cornell University Medical College, participated in a five-year research program supported financially by the Committee on the Problems of Alcohol of the National Research Council. The introductory chapter by Diethelm summarizes the results of the very diverse investigations which constituted the research program. What provided the relatively most distinguishing mark of this research was the attempt (initiated by Diethelm) to differentiate among three emotional states—anxiety, tension and resentment—by means of clinical observations, biochemical studies, and the Rorschach test. It is reported that the Rorschach examinations, administered and interpreted by Emil Oberholzer, not only discriminated very successfully among those emotions but correlated very highly with M. Freile Fleetwood's biochemical identification of the three emotions. "The results of the biochemical and psychological investigations were compared with the Rorschach studies. There was a strong agreement, about 90 per cent, of all these findings in the presence of anxiety or resentment while a lesser agreement, 75 per cent, existed with the emotion of tension." Unfortunately nothing more is said about the Rorschach study and the reader is not informed about the Rorschach criteria that were used, the overlap of signs for the emotions, and the method of quantification which permitted a direct comparison between the Rorschach and the biochemical findings. No data are offered which would permit a judgment as to the feasibility of clinically differentiating among the emotions and the frequency with which two or all three occur simultaneously. The clinical definitions are clear and the reassuring statement is made that "there seems to be little difficulty for well trained psychopathologists and clinical psychiatrists to recognize signs present in a patient; its application to animal experimentation is more difficult." Mary Sherfey's chapter, "Psychopathology and Character Structure in Chronic Alcoholism", is based on psychiatric case histories of 161 alcoholics. Her main interest was to divide the patients into smaller groups to describe patterns of drinking. Cases with well-defined diagnostic categories constituted 43 per cent, and cases "not belonging to any usual diagnostic category" (character disorders) constituted 57 per cent of the group. The etiological conclusion is: "Unexpressed resentment would appear to be the most frequent underlying emotion which provokes drinking and is relieved by it . . . Physiological tension is relieved." Fleetwood's "biochemical experimental investigations of emotions and chronic alcoholism", were based on investigations of A. T. Milhorat who had modified one of Cannon's methods and applied it to the study of emotions. The purpose was to find biochemical correlates of anxiety, tension and resentment and to find out how alcohol affects those correlates. Fleetwood reports positive results. If similar results are obtained from other patient groups and by other investigators, an important advance in the physiology of alcoholism will have been confirmed. Manfred Bleuler in his "Familial and Personal Background of Chronic Alcoholics" traced the incidence of mental illness among 1313 relatives of 50 patients. He reached the same conclusion as have many other investigators, viz., that the incidence of psychosis and mental deficiency among relatives of alcoholics is no higher than in the total population of the same socio-economic level. In "A Comparative Study of Constitutions of Swiss and American Alcoholic Patients", M. Bleuler compared the 50 American patients described in the previous chapter with 50 Swiss alcoholics. The two groups differed in many pertinent aspects: intellectual and educational levels, socio-economic status, age at onset of chronic alcoholism, duration of chronic alcoholism, and degree of somatic and mental damage. Although alcoholism and psychopathis personality traits were more frequent in the Swiss group, the incidence of schizophrenia, manic-depressive psychosis, epilepsy and mental deficiency among the relatives of the Swiss patients was no higher than in the total Swiss population. The last chapter by Milton Barnett, an anthropological study, describes "Alcoholism in the Cantonese of New York City." While attitude toward drinking is permissive and drinking is wide-

spread, drunkenness among the immigrants is rare because of long-established family and community tradition. The second generation Chinese, however, who exhibit considerable acculturation and loosening of traditional Chinese controls, manifest a trend toward heavy drinking. In general this book confirms the prevalent view regarding the etiology of chronic alcoholism.

Z. A. PIOTROWSKI

BOOKS RECEIVED FOR REVIEW

January, 1957

American Psychiatric Association. *Psychiatric Research Report 6.* Conference held at University of California School of Medicine, Los Angeles, California, January 26 and 27, 1956. American Psychiatric Association, Washington, D. C.

DEGREEFF, E. *I. L'Homme Criminel.* Editions Nauwelaerts, Louvain, France.

DEGREEFF, E. *II. L'Homme Devant L'Humain.* Editions Nauwelaerts, Louvain, France.

EHRENWALD, Jan. (Ed.) *From Medicine Man to Freud.* Dell Publishing Co., New York, N. Y.

FUNKENSTEIN, DANIEL H. AND WILKIE, GEORGE H. *Student Mental Health: An Annotated Bibliography, 1936–1955.* World Federation for Mental Health, New York, N. Y.

HALL, CALVIN S. AND LINDZEY, GARDNER. *Theories of Personality.* John Wiley & Sons, Inc., New York, N. Y.

SARTRE, JEAN-PAUL. *Der Leib. Ein Kapitel aus das Sein und das Nichts.* Ferdinand Enke, Verlag, Stuttgart, Germany.

WALLIN, J. E. W. *Mental Deficiency.* Journal of Clinical Psychology, Brandon, Vermont.

WERTHEIMER, PIERRE. *Neurochirurgie Fonctionelle.* Masson & Cie, Paris, France.

NOTES AND NEWS

FELLOWSHIPS IN PSYCHIATRY

The American Psychiatric Association has announced the award of 14 Smith, Kline & French Foundation Fellowships in Psychiatry. At the same time, the APA announced that the next review of applications will be held in May. Applications must be received by April 15 by the Fellowship Committee, P.O. Box 7929, Philadelphia, Pa.

The 14 Fellowships range from a grant to the Montana State Hospital for the establishment of a training program for the hospital's psychiatric staff, to a number of smaller grants to enable medical students to participate in psychiatric programs during their summer vacations. Also included among the recipients are a doctor from Canada and an Assistant Professor of Medicine in the Philippines, both of whom will be studying in the United States.

These 14 grants total $38,454 and represent the largest amount given in one year under the Smith, Kline & French Foundation's total grant of $90,000 for the three years 1955 through 1957.

The Smith, Kline & French Foundation is the independent philanthropic arm of Smith, Kline & French Laboratories, Philadelphia pharmaceutical manufacturer. The Fellowships are administered by a committee named by the American Psychiatric Association and consisting of Doctors Kenneth E. Appel, Philadelphia, Chairman; Daniel Blain, Washington, D. C.; Henry Brill, Albany, N. Y.; Jacob E. Finesinger, Baltimore; Francis J. Gerty, Chicago; Robert G. Heath, New Orleans; David A. Young, Raleigh, N. C.; and Seymour D. Vestermark, Bethesda.

The SKF Foundation Fellowships are motivated by two beliefs: First, that it is essential to bring new knowledge of therapies, techniques and practices to bear on the treatment and care of patients in public mental hospitals and schools for the retarded, and second, that the recruitment of a vast new corps of psychiatrists is direly needed.

Seven main types of Smith, Kline & French Foundation Fellowships are available:

A. Support for advanced training for full-time staff psychiatrists of public mental hospitals and schools for the retarded.

B. Awards to hospitals for visiting lectureships and for teaching fellowships.

C. Support for medical schools, teaching centers, etc., for extension training programs.

D. Student fellowships to encourage talented medical students to engage in summer activities in psychiatry. The aim here is not only to draw more students into psychiatry as a life work, but also to expand the psychiatric knowledge of those who plan to enter other fields.

E. Medical fellowships to encourage broadened skill in psychiatric problems of everyday practice by physicians other than psychiatrists.

F. Foreign scholar lectureships to bring outstanding men to the United States.

G. Residency training fellowships under unusual circumstances.

Applications and further information may be obtained from the Fellowship Committee, Box 7929, Philadelphia.

THE CINCINNATI SANITARIUM CHANGES ITS NAME TO HONOR ONE OF OHIO'S FIRST PSYCHIATRISTS

Numbering among the country's oldest private psychiatric hospitals, The Cincinnati Sanitarium has officially changed its name to The Emerson A. North Hospital in honor of a physician who was once in residence there. The announcement of the change was made by hospital president Elliott Otte.

Established in Cincinnati in 1873, the institution now known as The Emerson A. North Hospital, has kept pace with modern diagnostic and treatment procedures. It is one of the first such hospitals to create a separate out-patient department for electroshock therapy.

Dr. Emerson A. North, who died August 21, 1953, was born in Patriot, Indiana, seven years after the original hospital was opened. He attended Purdue University, Lafayette, Indi-

ana, from 1899 to 1902, when he entered the College of Medicine, University of Cincinnati. He received his doctor of medicine degree in 1906.

After interning in 1907–08 at Cincinnati's Jewish Hospital, Dr. North served from 1908 to 1911 as assistant in psychiatry at Longview State Hospital, Cincinnati, Ohio, where he was to return in 1917 as superintendent. From 1913 to 1917 he was resident psychiatrist at the hospital that now bears his name. He continued as Longview superintendent through 1923.

His first University of Cincinnati appointment was in September 1925, when he was named lecturer on psychology in the McMicken College of Arts and Sciences. A long succession of posts at the university followed.

In September, 1926, he was appointed assistant professor of psychiatry in the College of Medicine; in 1931 he was promoted to associate professor and acting head of the department of psychiatry; and within a few months received a further advance in rank as full professor and head of the department.

Mr. North resigned from his active university connections July 1, 1942, when he was given the honorary title of professor emeritus of psychiatry.

The Emerson A. North Hospital is equipped to provide all modern and accepted methods of treatment. It has ample classification facilities with qualified psychiatric nursing. It maintains the Rest Cottage, a separate department with separate housing for mild neurotic problems and the convalescent.

Recently an Out-Patient Building was constructed for the exclusive use of ambulatory out-patient electro-shock therapy. Erected as a memorial to Harry Peers Collins, who was president and guiding hand of the hospital for 45 years, the building with its 14 treatment rooms is known as the Harry Peers Collins Memorial Pavillon.

The Emerson A. North Hospital is located at 5642 Hamilton Avenue Cincinnati, Ohio. Doctor Owen C. Clark is the Medical Director.

FRIEDA FROMM-REICHMANN MEMORIAL LECTURE

The William Alanson White Psychoanalytic Society is sponsoring a lecture as a memorial to Dr. Frieda Fromm-Reichmann. It will be delivered by Edith Weigert, M.D., at the Academy of Medicine, New York City, on January 10th, 1958, at 8:30 p.m. The title of Dr. Weigert's paper is *The Rediscovery of Trust in Psychotherapy.*